BUREAU OF HYGIENE AND TROPICAL DISEASES.

TROPICAL DISEASES BULLETIN.

Vol. 24.] 1927. [No. 6.

MEDICAL ZOOLOGY.

PATTON (W. S.). **Blood-Sucking Arthropods of Medical and Veterinary Importance in China.**—*China Med. Jl.* 1926. June & July. Vol. 40. Nos. 6 & 7. pp 543–553; 603–612.

The title of this paper is somewhat misleading. The paper is not a monograph of the species of blood-sucking arthropoda proper to China, but is a compendium or syllabus of the elements of medical zoology, published with the praiseworthy object of assisting medical men and zoologists in China to observe and collect intelligently and purposefully.

A. Alcock.

FELT (E. P.). [**Report of**] **State Entomologist** [**for 1924**].—*New York State Mus. Bull.* Albany, New York. 1925. June. No. 260. pp. 46–54. [Summarized in *Rev. Applied Entom.* 1926. Dec. Vol. 14. Ser. B. Pt. 12. p. 209.]

Here the following memorabilia are to be found :—

Young maggots of *Wohlfartia vigil* removed from a man's conjunctiva. Larva of *Attagenus piceus* (black carpet-beetle; Dermestidae) in one case vomited, in other case removed from the vagina. Larva of *Tineola biselliella* (a clothes moth) removed from urethra. Houses haunted by bats may also be infested by the bat-Cimex (*C. pilosellus*), which is often mistaken for the much more obnoxious bed-bug. Both bats and bugs in buildings can be destroyed with calcium cyanide.

A. A.

WILLIAMSON (K. B.). **Mosquito Researches.**—*Malayan Med. Jl.* 1926. Dec. Vol. 1. No. 4. pp. 21–27.

Although a good deal of the information contained in this valuable report is of only local importance it contains numerous items of general interest, particularly in its experimental investigation of the surmise first expressed by Sir Malcolm WATSON that the fitness of a potential breeding-place for Anopheles is determined by the composition of the water. One of the most general conclusions is that "all* observations

* From the passage quoted it might be thought that diminution of *acidity* is accompanied by diminished breeding. What is meant is that a fall of the pH figure (i.e., *increased* acidity) is accompanied by lessened breeding. Early in the paper the author speaks of "the acidity (pH)"; acidity and pH are not, however, interchangeable terms. As acidity rises, the pH figure falls and *vice versa*. The confusion arises from the wrong use of the symbol pH as synonymous with hydrogen ion concentration and so with acidity. The symbol pH stands for the logarithm of the *reciprocal* of the H. ion concentration and so rises and falls inversely with acidity. A useful article on hydrogen ion concentration and pH was published in the *Bulletin of Hygiene*, Vol. 1, p. 247–8.—Eds.

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point to the almost complete cessation of anopheline breeding [in growing rice fields] when the acidity of the water falls to pH6, and a sharp decrease below pH 6·4," although it is emphasized that on one occasion larvae of rice-field species were found in abundance in a drain (between rice-fields) where the water varied from pH 5·3 to 5·6. Another general conclusion from comparisons between certain dissimilar waters sterile to Anopheles *in situ* and the same waters made fertile to Anopheles in the laboratory, is that the natural sterility of waters may be due to their deficiency in food-stuff. These experiments were made by introducing small floating cages of bamboo and muslin into the natural waters that were free from Anopheles breeding, the cages containing some of them well-grown Anopheles larvae and some of them Anopheles eggs, in measured numbers ; the results of the observations are compared with the results of laboratory experiments where larvae and eggs were placed in water from the same natural sources in some cases without food, in other cases with a suitable supply of food. The results of the ingenious experiments here described justify the conclusion—probably of general import, but at least for the particular waters examined and the particular species of Anopheles made use of for experiment—that the food-factor is the determining one.

Experiments and observations are recorded respecting the larvicidal powers of common aquatic (paddy-field) bugs and of common paddy-field fishes. Among bugs the Belostomidae were found most efficient. Among fishes an Ophiocephalus, the species of which are not usually credited with eating anopheline larvae, were voracious enough in the laboratory, though not equal to the well known Osphromenus.

The flora associated with areas in Perak where the amount of Anopheles breeding is known receives notice. The presence of a Utricularia (*U. flexuosa*) " appears to characterize either the limitation of anopheline species to *A. sinensis* and *barbirostris* or the complete, or nearly complete, absence of all anopheline breeding."

The larvicidal properties of roasted *amang*—a ferruginous residue from a local mine—are described as sufficient to justify its practical probation. Rubber oil is also noticed as an efficacious larvicide, either alone or as an adjuvant to other oils.

The statement is made that algae form only a small portion of the food of Anopheles larvae, the bulk of their food being " of an amorphous character and of obscure origin " ; [but this generalization must depend on very much limited observation—perhaps on observations of larvae from rice-fields at some particular time].

A. A.

HAROLD (C. H. H.). **Studies in Mosquito Bionomics.**—*Jl. Roy. Army Med. Corps.* 1926. Aug. & Sept. Vol. 47. Nos. 2 & 3. pp. 81–94 ; 180–187. [11 refs.]

Among the contents of these discursive notes is a discussion on the influence of the pH of the water upon mosquito larvae ; from the author's observations and experiments one gathers support for the commonsense view that the food-supply is the determining factor in rapid and healthy growth in nature. Another matter discussed is the value of cresol as a larvicide. The author points out that since crude

cresol is not a definite chemical compound, and commercial cresols contain other coal-tar derivatives, as well as excipients, a trade "cresol" may be a good germicide and disinfectant without being also a good larvicide. It is of general interest to note certain circumstances observed by him to influence the larvicidal efficacy of a given "cresol" and the interpretation of its larvicidal effects. Larvicidal efficiency is increased at high temperatures of the medium, also by increased acidity (but only by addition of acid much in excess of anything to be met with in natural waters), also by addition of NaCl; but it appears to be diminished, or retarded by the presence of silt in the medium, and by stabilizing ingredients other than soap in the cresol. Furthermore, larvae may become more or less habituated to cresol in non-lethal dilutions, and they may recover completely after lengthy immersion in a dilution of which the immediate effect has appeared to be fatal, particularly if when apparently dead they are removed to clean water. Another important note is that Anopheles larvae are very much less susceptible than Culex larvae to cresol of the same quality, a phenomenon which the author attributes to their resting position at the surface of the water where they get unpoisoned air. For the same reason pupae are tolerant of cresol.

A. A.

Edwards (F. W.). **Mosquito Notes.—VI.**—*Bull. Entom. Res.* 1926. Oct. Vol. 17. Pt. 2. pp. 101–131. With 11 text figs.

There are eight fascicles of these Notes, dealing respectively with (1) the races of *Aëdes variegatus*; (2) the species of the *kochi* group of the Aëdes subgenus *Finlaya*; (3) new species of *Culex* from the Australasian islands; (4) additional records of Culicini from the Solomon islands; (5) a collection of culicines and aedines from Tasmania and S.E. Australia; (6) some culicine larvae and some specific records from Singapore; (7) some specific records from Katanga, Belgian Congo, including the remarkable *Anopheles implexus*, the pupa and the characteristic structures of the adult and larva of which are figured; and (8) the culicine fauna of Nairobi.

A. A.

Severn (A. G. Millott). **The Mosquitoes of Hongkong.**—*Caduceus.* Hongkong. 1926. May. Vol. 5. No. 1. pp. 5–9.

The author notices previous surveys of the mosquitoes of Hongkong —by Dr. J. C. Thomson in 1900–01, and by Dr. H. Macfarlane in 1912–14. His own survey was made in 1925 and the specific identifications have been done by Edwards of the British Museum; his list includes 4 species of Anopheles (against 8 species contained in Macfarlane's collections, which also were identified by Edwards) and 21 of Aedines and Culicines. In the author's experience the Anopheles of most frequent occurrence are *A. maculatus*, *A. sinensis* (also called *hyrcanus*), and *A. minimus*; they seem to be commoner in the winter months, probably owing to the damming in those dry months of streams that in the rainy season are too turbulent for mosquito-breeding. The commonest of all mosquitoes, and persistent through all seasons, is *Culex fatigans*. *Stegomyia fasciata* (*Aëdes aegypti* or *argenteus*) was found only once in the course of more than a year by the author, who notes also that this species is not included in Thomson's list of 1900–01. **A. A.**

Borel (M.). Note préliminaire sur les moustiques de Cochinchine et du Sud Annam (Massif du Langbian). [**Mosquitoes of Cochin China and South Annam.**]—*Bull. Soc. Path. Exot.* 1926. June 9. Vol. 19. No. 6. pp. 472–479. [2 refs.]

As a result of systematic collection during the year 1925 the author gives a list of 45 species of mosquitoes, of which 10 are Anopheles, studied by him in Cochin China and South Annam. All appear to be species well known in the Oriental Region. Particulars are given of haunts, habits, places of capture, etc., of adults and larvae. It is stated that *Stegomyia fasciata* is not rare in Indo China and that its eggs have never been found by the author in any natural waters. *Armigeres obturbans* is the only species in the list that is not found all the year round ; it occurs only in the dry season and beginning of the rainy season.

A. A.

Yamada (Shinichiro). **A Revision of the Adult Anopheline Mosquitoes of Japan : Systematic Descriptions, their Habits and their Relations to Human Diseases, together with an Account of Three New Species.**—*Scientific Reports from Govt. Inst. for Infectious Diseases.* Tokyo. 1924–25. Vols. 3 & 4. pp. 215–241 ; 447–493.

This is a systematic account of the Anopheles of Japan of which 14 species are known. It appears to be a very thorough piece of work ; in every instance a full description of male and female is preceded by a critical list of synonyms and is followed by notes on distribution, habits, relation to disease and frequently also by historical remarks. As the title indicates, only the adult forms are included.

A. A.

Brug (S. L.). **The Geographical Distribution of Mosquitoes in the Malayan Archipelago.**—*Meded. Dienst d. Volksgezondheid in Nederl.-Indië.* 1926. Pt. 4. pp. 471–482. With 1 map.

This is a zoogeographical paper. The Macassar Strait (between Borneo and Celebes) and a line in its continuation between Bali and Lombok was determined by Wallace as the north-western boundary of the Australasian Region. Observers since Wallace have found that " Wallace's Line " is not so sharply defined as Wallace at first supposed. The present author's study of the distribution of mosquitoes confirms these later observers. He finds that the mosquitoes of the Celebes, Moluccas, and Western Sunda Archipelago—all lying on the Australian side of Wallace's Line—are mostly Oriental, though Australian species occur in those islands, and in increasing numbers as one proceeds eastwards from the Line.

A. A.

Rodenwaldt (Ernst). Entomologische notities IV [**Entomological Notes IV.**]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1926. Vol. 66. No. 6. pp. 787–799. With 3 text figs.

In Sumbawa Is., coincident with the formation of brackish fishponds, and at Bencoolen (Sumatra) where, owing to drought, small streams that should drain into the sea have formed brackish pools among the

sand dunes, *Myzomyia ludlowi* has appeared and, in its wake, malaria; both have been controlled. The freshwater variety of this mosquito has been found in Sumatra at a height of 650 and 900 m. *M. barbirostris* here hitherto considered as a "wild," rather harmless species, is found haunting human habitations in the isle of Soemba. *N. maculatus* in Java (Preanger) is found only in rubber plantations with little shade; since the plantations were begun malaria has become very prevalent. *S. aitkenii var. palmata* (Java: Preanger) is described as a new larval variety; it has the large brown abdominal scuta hitherto peculiar to *M. aconita*, and the inner shoulder-hair in the very unusual form of a fan with narrow leaves.

N. H. Swellengrebel.

Root (Francis Metcalf). **Studies on Brazilian Mosquitoes. I. The Anophelines of the *Nyssorhynchus* Group.**—*Amer. Jl. Hyg.* 1926. Sept. Vol. 6. No. 5. pp. 684–717. With 1 text fig. & 9 plates. [17 refs.]

This paper deals with certain Tropical American species of Anopheles which most authors hitherto have assigned to the "Cellia" group, though, according to the views of Christophers, they belong to the "Nyssorhynchus" group; and it treats with very full detail those of the said species that have the last three tarsal segments of the hind-legs entirely, or almost entirely, white. Most authors outside Brazil recognize only three species in this kind, namely "*Cellia*" *argyrotarsis* with the said segments entirely white, and "*Cellia*" *albimanus* and *tarsimaculatus* having a black band on the last of the said white segments. The author has carefully studied the Anopheles of this description on the spot and in the field, and has examined eggs and larvae and pupae of some of them, and he describes and discusses here the results of his studies. In the result he recognizes 7 distinct species and 1 distinct variety among them. All this is exclusive of three other reputed species that Christophers has provisionally placed among local races of *tarsimaculatus*, which the author has not yet studied.

A. A.

Campos (F.). [Estudios biológicos sobre los mosquitos de Guayaquil y alrededores.] [**Biological Studies of the Mosquitoes of and around Guayaquil.**]—*Rev. Col. Nac. Vicente Rocafuerte.* Guayaquil. 1925. Sept.–Dec. Vol. 7. No. 21–22. pp. 3–49. With 8 plates. [Summarized in *Rev. Applied Entom.* 1926. Aug. Vol. 14. Ser. B. Pt. 8. p. 152.]

In a year's survey around Guayaquil in Ecuador 32 species of mosquitoes were observed, among them *Stegomyia fasciata*, the familiar biology and bionomy of which are described, and 5 species of Anopheles, to wit, *tarsimaculatus* (which includes holes in trees among its other impartial breeding-places), *pseudopunctipennis* (appearing in December and January), *punctimacula* (a bush species, uncommon, breeding in stagnant waters, and occurring in June and July), *mediopunctatus* (another uncommon bush species, and possibly identical with *punctimacula*), and *hylephilus* (which breeds in Bromeliaceae and is rare).

A. A.

Falleroni (Domenico). Fauna anofelica italiana e suo "habitat" (paludi, risaie, canali). Metodi di lotta contro la malaria. [**Anopheline Fauna of Italy and its Habitat (Marshes, Ricefields, Ditches). Control Methods of Malaria.**]—*Riv. di Malariologia.* 1926. Sept.–Dec. Vol. 5. No. 5–6. pp. 553–593. With 6 figs. on 1 plate. [Refs. in footnotes.] [English summary p. 738.]

This paper, which relates to malaria-carrying mosquitoes and the control of malaria in marshes and rice-fields in certain districts of Italy, does not contain anything new. According to the "English summary" the author's conclusion is that an increase in the number of domestic animals in well-adapted and well-placed "stables" must be the principal prophylactic measure against malaria, in such districts.

A. A.

La Face (Lidia). Revisione degli Anofelini Italiani. Nota IIa. Osservazioni sugli Anofelini del Ferrarese. [**Revision of Italian Anophelini. II Note. Observations on Anophelini about Ferrara.**] —*Riv. di Malariologia.* 1926. July–Aug. Vol. 5. No. 4. pp. 381–391. [7 refs.] [English summary pp. 551–552.]

The author is satisfied that *Anopheles elutus* is a species distinct from *maculipennis*. She has bred, in her laboratory, from hundreds of females identified with *elutus* and laying eggs without floats, individuals of a second generation corresponding with *elutus*. She has also noticed a distinct prevalence of *elutus* in malarious districts during the summer, and, on the other hand, a predominance of *maculipennis* in districts where malaria is scarce. She calls attention to the abundance of *elutus* in dwellings. She suspects that *elutus* "can adapt themselves to a certain degree of salt" in their breeding-grounds.

A. A.

Schingarew (N.). La revision des anophèles de Russie. [**Revision of Anopheles of Russia.**]—*Bull. Soc. Path. Exot.* 1926. Dec. 8. Vol. 19. No. 10. pp. 896–899.

The total number of species and varieties of Anopheles appertaining to the fauna of Russia [including Turkestan and S. Caucasia] is here said to be 16. Among these is here meagrely described a "new species" (*A. martinius*) from Turkestan, and new varieties of, respectively, *A. algeriensis*, *A. hyrcanus*, and *A. superpictus*. *A. elutus* Edw. [doubtfully distinct from *A. maculipennis*] is here said to be the same thing as *A. saccharovi* described by Fawr in 1903.

A. A.

Dunn (Lawrence H.). **Mosquitos bred from Dry Material taken from Holes in Trees.**—*Bull. Entom. Res.* 1926. Oct. Vol. 17. Pt. 2. pp. 183–187.

Report of an interesting survey of the rot-holes and hollows of trees, made at Lagos during the dry season, with the object of investigating their potential importance as crèches for eggs, and prospective nurseries for larvae of mosquitoes. Material was taken from 114 holes in 100 trees—mango, breadfruit, banyan, bitter kola (Garcinia), and two trees not identified. Only holes that were perfectly

dry were taken notice of, and the material collected included not only leaves and loose débris, but also scrapings from the sides and bottom of the holes. When the collections were transferred, severally, to small dishes of water in the laboratory, mosquitoes were bred from the material from 40 holes, to wit 8 species of Aedes—namely, *Ae. luteocephala, wellmani, africanus, apicoannulatus, apicoargentea, aegypti, simpsoni,* and *longipalpis*—notwithstanding that the original holes had harboured an abundant and voracious fauna.

As the holes when examined were perfectly dry, and since no rain fell during the 61 days of the continuous survey, the author feels justified in concluding that the eggs of the species named are resistant to drought and remain viable [as is known to be the case with *Ae. aegypti*] through the whole of the dry season till the ensuing rains.

All samples of material were collected by, or in the presence of the author, and all precautions were taken to ensure exactitude of individual observations throughout. *Aedes aegypti* (*Stegomyia fasciata*) was bred in one instance from a tree standing about 125 yards from the nearest habitation.

A. A.

Koidzumi (M.). **Eight Years' Observation of the Seasonal Prevalence of *Anopheles sinensis* W. in Formosa, with some Remarks on the Influence of Climatic Conditions and on the Habits of the Mosquitoes.** —*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1926. July. No. 256. English summary pp. 1–4. [In Japanese.]

Since the year 1913 the author has made daily collections of mosquitoes at Taihoku (in Formosa) where he finds the genus *Anopheles* to be represented by three species—*sinensis, minimus,* and *tessellatus*. In the case of *sinensis* he has observed a distinct seasonal distribution. It has two main periodic swarmings, one at the beginning of the hot weather (last 10 days of April and first 10 days of May), the other at the end of the hot weather (last 10 days of September and first 10 days of October), and a less conspicuous swarming 60 or 70 days after each main swarming. Formosa is a notorious nursery of typhoons, and the author's experience is that typhoons stimulate rather than discourage the production of mosquitoes.

A. A.

Chalam (B. S.). **The Breeding of Anopheles in Sea-Water and at a Short Distance from the Shore.**—*Indian Med. Gaz.* 1926. Aug. Vol. 61. No. 8. pp. 375–376. [1 ref.]

The author has found *Anopheles subpictus, stephensi, culicifacies,* and *vagus* breeding freely in pools of seawater in that part of the Bombay town littoral known as Back Bay. He notes [what is well known] that mosquito larvae are not at all likely to be found in pools that are flushed daily by the tides, but adapt themselves only to such pools as are filled periodically at high water spring tide—pools where, as a result of evaporation during the intervals between spring-tides, the sea-water may become actually briny.

A. A.

Hoffman (W. A.). **Resting Position of Haitian Anopheles.**—*Amer. Jl. Trop. Med.* 1926. Sept. Vol. 6. No. 5. pp. 377–379. With 4 figs. on 1 pl. [3 refs.]

The author states of the two Haitian species of Anopheles that they can be distinguished by their resting attitude; in *A. albimanus* the body projects at the usual anopheline angle, while in *A. grabhamii* it sticks out almost at a right angle.

A. A.

Falleroni (Domenico). Note sulla biologia dell' "*Anopheles maculipennis.*" [**Notes on Biology of** "*Anopheles maculipennis.*"]—*Riv. di Malariologia.* 1926. July–Aug. Vol. 5. No. 4. pp. 353–380. [14 refs.] [English summary p. 551.]

It is noted that when an Anopheles sucks living blood the blood usually passes straight to the stomach, but that when other liquids are imbibed they pass at first into the crop; the former process is here distinguished as "puncture," the latter as "simple aspiration." It is also noted that the nutritional and reproductive activities of *A. maculipennis* are modulated, but are not in abeyance, during the winter; also that malariated individuals of this species may be found in winter. [None of these observations is new.]

A. A.

Beklemishev (V.) & Mitrofanova (Yu). [**On the Ecology of the Larvae of** *Anopheles maculipennis*, **Meig.: the Problem of Distribution.**] [In Russian.]—*Bull. Inst. Recherches Biol. & Sta. Biol. Univ.* Perm. 1926. May 18. Vol. 4. Pt. 7. pp. 285–332. With 2 figs. [35 refs.] English summary pp. 332–337. [Summarized in *Rev. Applied Entom.* 1926. July. Vol. 14. Ser. B. Pt. 7. pp. 130–131.]

The optima for larvae of *Anopheles maculipennis* are said to be calm shallow neutral or alkaline waters super-saturated with O, rich in submerged flora (and fauna), and exposed to direct sunlight. Young larvae in the laboratory were observed to remain alive for a time in water of pH below 7, and poor in oxygen, and also to withstand lack of atmospheric air better than older larvae; at no stage, and not even in running water saturated with O (temperature 15°–30° C.) could larvae endure being cut off entirely from the O of the atmosphere. Young larvae are said to live entirely on vegetable, older larvae chiefly on animal matter. The influences both of dissolved O and of pH are considered to be indirect—on food-supply. It is stated that eggs of Anopheles are seldom, if ever, found in nature in waters in which larvae cannot grow to maturity. If this be a general truth of Nature then, it is argued, the additional fact that Anopheles hampered by laboratory conditions lay eggs that hatch and give issue to larvae that may survive for a time under laboratory restrictions supports the conclusion that the mother Anopheles in nature chooses her breeding places by unfailing instinct.

A. A.

Roukhadzé (N.). L'hibernation des anophéles et des stegomyia en Abasie (Géorgie maritime). [**Hibernation of Anopheles and Stegomyia in Georgia.**]—*Bull. Soc. Path. Exot.* 1926. June 9. Vol. 19. No. 6. pp. 480–487. [7 refs.]

There is nothing at all new or strange in this paper, the author observing that (in Georgia) *Anopheles maculipennis* hibernates in the fertilized female stage, *A. bifurcatus* in the larva stage, and *Stegomyia fasciata* and *scutellaris* in the egg stage.

A. A.

Borel (M.). Au sujet de l'action empêchante de la couleur blanche sur la ponte des moustiques, dans les jarres indigènes blanchies à la chaux. [**The Whitening of Native Pots a Deterrent to Mosquito Breeding.**]—*Bull. Soc. Path. Exot.* 1926. Oct. 13. Vol. 19. No. 8. p. 702. [1 ref.]

The author refers to his former paper (see this *Bulletin*, Vol. 23, p. 708) describing the inhibitive effect of lime-washed water-barrels upon the breeding of house mosquitoes. He now once more emphasizes the fact that it is the uniform whiteness of the interior and exterior of the barrel that scares the broody mosquitoes, and not any imagined property of the whiting itself upon mosquito larvae, that is the essential principle. Therefore it is quite obvious that the domestic water-butt must be *kept white.*

A. A.

Prado (Alcides). Especie de anophelineo raremente encontrado no estado de S. Paulo. [**Species of Anopheles rarely met with in S. Paulo State.**]—*Ann. Paulist. Med. e Cirurg.* 1926. Aug. Vol. 14. No. 8. pp. 90–93. With 2 text figs. [3 refs.]

This is merely a note on the occurrence of *Anopheles tibiamaculatus* in the district of S. Paulo, and a brief redescription of the species.

Borel (M.). Note sur les gîtes de *Neocellia maculata* en Cochinchine et dans le Sud-Annam. [**The Breeding Sites of *A. maculatus* in Cochin China and S. Annam.**]—*Bull. Soc. Path. Exot.* 1926. Oct. 13. Vol. 19. No. 8. pp. 703–704.

The author states that in two plantations he has found abundance of larvae of *Anopheles maculatus* in water-courses fringed with herbage (herbes abondantes, mais de peu de hauteur).

Jatzenko (Th.). Ueber die Auswahl der Winterungsräume von Malariamücken *Anopheles maculipennis* Meig. in der Ukraina. [**On the Choice of Winter Quarters by *Anopheles maculipennis* in the Ukraine.**]—*Rev. Microbiol. et Epidémiol.* 1926. Vol. 5. No. 4. German summary p. 334. [In Russian pp. 277–278.]

Observations continued throughout the winter have satisfied the author that in the Ukraine *Anopheles maculipennis* chooses for hibernation quiet spots and dark surfaces in damp, warm, dark rooms.

Fermi (Claudio). Note di anofelinologia. [**Notes on Anophelinae.**]—*Riv. di Malariologia.* Rome. 1926. Mar.–Apr. & May–June. Vol. 5. Nos. 2 & 3. pp. 113–131; 286–302. [42 refs.] [English summary p. 250; 350–351.]

There is nothing new or suggestive in these Notes which seem to be referable to the particular Palaearctic species *Anopheles maculipennis.*

A. A.

PATTON (W. S.) & HINDLE (Edward). **Reports from the Royal Society's Kala Azar Commission in China. Notes on the Species of Sandflies (Genus *Phlebotomus*) of North China.**—*Proc. Roy. Soc.* 1926. Dec. 10. Vol. 100. Ser. B. No. B 705. pp. 405–412. With 7 text figs. [7 refs.]

The Commission has not yet had opportunity for an intent survey of Phlebotomus in N. China, but up to the present is aware of 3 species, namely, *P. major* var. *chinensis*, NEWSTEAD'S variety of *P. sergenti*, and a new variety of *P. perturbans*. The first, in females of which YOUNG and HERTIG found the parasite of Chinese kala azar to develop with frequency, is widely distributed in N. China, is a very common pest in Peking at the end of May and in June, and is thought to have but a single brood. The second, in females of which YOUNG and HERTIG found flagellates, is said to be common in Peking and Hsüchowfu from mid-June to September, and is believed to have two or more broods. The third was observed by Patton to be common in certain places during July and August and in one place appeared to be biting man. All three forms are described here.

The Commission did not have much difficulty in managing the transport of *P. argentipes* from Calcutta to China. From eggs and larvae shipped at Calcutta at the end (30th) of July, and kept at sea in an ordinary cabin, a batch of adults duly issued, and these, fed at sea, duly gave issue to eggs (laid on moist plaster of Paris). The eggs had perforce to be left unattended for 3 or 4 days at Hongkong, and the young larvae that were beginning to hatch from them had, in their turn, to be left without any attention during the land journey from Shanghai to Tsinan, yet in spite of all, two adults of the second (sea-born) generation appeared in the laboratory at Tsinan, on the 10th October, although, unfortunately, both of them were females and had to wither on the virgin thorn.

A. A.

YOUNG (T. C. McCombie). **Some Observations on Sandflies in Bombay City.**—*Indian Jl. Med. Res.* 1927. Jan. Vol. 14. No. 3. pp. 679–683. [7 refs.]

The author discloses the unsuspected existence in Bombay City of *Phlebotomus argentipes*, *P. papatasii*, and *P. minutus* and its *niger* variety. The first, which is obtrusive only in the three months preceding the inset of the S.W. monsoon (although it can be detected by nocturnal search " at all times "), occurs in the vicinity of cowsheds throughout the city, and has been found even in good houses. The second, which has been complained of in good houses, mostly in the neighbourhood of the earthworks connected with the Back Bay reclamation, disappears with the inset of the S.W. monsoon. *P. minutus* and its variety have so far been found on three occasions in three separate places.

Contingent on the link between *P. argentipes* and kala azar the author points to the observation of NAPIER and others of a strip of the west coast which includes Bombay where the conditions of temperature and humidity seem comparatively favourable for the transmission of that disease. Cases of kala azar are said to have come to light occasionally in the City, although the disease has been declared officially to be " practically unknown " in the Presidency of Bombay.

A. A.

Rossi (P.). Contribution à l'étude du phlébotome en Aunis. [**A Study of Phlebotomus in Aunis.**]—*Bull. Soc. Path. Exot.* 1926. Oct. 13. Vol. 19. No. 8. pp. 705–709.

Phlebotomus perniciosus is not a rare insect at Aunis where (at La Rochelle) the author has studied its habits in nature and to some extent in captivity. His observations are in general accord with those of those other observers of other species.

The adult insects are to be found only in summer (June to September), and then only in fine weather, since they cannot endure wind or rain. In the day-time they hide in underground rooms, privies, etc., and at evening they go out to feed, not flying far from their breeding-haunts. When hungry, however, as they are after detention by a spell of windy or rainy weather, they will feed at any time of day. Usually they bite only the exposed parts of the body. Females are to males in the proportion of 6 to 1. In captivity the female lays her eggs, to the number of 12 up to 18, on the 9th day after repletion, and dies that day or the next. The male lives only 7–9 days. The eggs hatch in about 10 days, always in the night time, and humidity is an imperative condition. The author's observations appear to have been interrupted at this point by some earth-born myriapods, which devoured his stock. *Phlebotomus perniciosus* is not known to have any pathogenous significance at Aunis. It is very sensitive to chloroform, benzene, and ether; less so to naphthalene and thymol.

A. A.

Nitzulescu (V.). Sur la constitution du canal alimentaire chez les phlébotomes. [**The Food Canal in Phlebotomus.**]—*Bull. Soc. Path. Exot.* 1926. Oct. 13. Vol. 19. No. 8. pp. 709–714. With 5 text figs. [1 ref.]

The author's conclusions from his own dissections and cross-sections of the proboscis is that the floor of the feeding-tube of Phlebotomus is formed not by the hypopharynx but by the mandibles. Leon, according to the author, has noticed an analogous disposition of the mouth-parts in *Culicoides pulicaris*.

A. A.

Nitzulescu (Virgil). Contribution à l'étude de l'appareil buccal des simulides. [**The Buccal Apparatus of the Simuliidae.**]—*C.R. Soc. Biol.* 1926. Dec. 3. Vol. 95. No. 35. pp. 1336–1338. With 2 text figs. [1 ref.]

The author states that in Simulium the relations between the mandibles and the unpaired mouth-parts are better shown in transverse sections of the proboscis than in simple dissections. His transverse sections show the existence of a longitudinal ridge on each mandible, which catches the corresponding incurved edge of the labrum-epipharynx to form a closed tube with the mandibles for a floor. When the mandibles are thus adjusted to form the epipharyngeal tube they also roof-in the hypopharyngeal salivary groove.

A. A.

Pinto (Cesar). *Phlebotomus neivai* e *Phl. fischeri* N. Sp. Sp.—Sobre o apparelho espicular dos phlebotomos e seu valor especifico. [*P. neivai* **and** *P. fischeri* **from S. Paulo.**]—*Sciencia Med.* 1926. July 31. Vol. 4. No. 7. pp. 370–375. With 6 text figs.

These two new species, both from the province of S. Paulo, Brazil, are described, and good figures are given of their male genitalia and of their maxillary palps. A figure of the male genitalia of *P. brumpti* of Larrouse —a third Brazilian species—is given for comparison, along with a brief differential diagnosis of this species.

Paterson (G.) & Shannon (R. C.). Nota preliminar sobre *Phleb. Araozi*, n. sp. [**Preliminary Note on** *P. Araozi*, **n. sp.**]—*Semana Méd.* 1926. July 22. Vol. 33. No. 29 (1697). pp. 236–237.

No description is given of this species—said to be the most southerly species of the genus Phlebotomus known to occur in S. America. It was first observed in the province of Jujuy at the north-westerly limit of Argentina.

Parrot (L.). A propos de *Phlebotomus caucasicus* et de *Phlebotomus sergenti*. [*P. caucasicus* **and** *P. sergenti*.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Dec. Vol. 30. No. 12. pp. 719–720.

Draws attention to the fact that *P. caucasicus* had been adjudicated a synonym of *P. sergenti* by several good authorities.

A. A.

Mumford (E. Philpott). **Three New Cases of Myiasis in Man in the North of England. With a Survey of Earlier Observations by other Authors.**—*Parasitology*. 1926. Dec. Vol. 18. No. 4. pp. 375–383. [20 refs.]

The author reviews previous records of myiasis of the urinary passages—both authentic, and more or less doubtful—and relates what he regards as two fresh authentic cases, both in the humbler ranks of society. The first was of an infant which seems to have been a sickly constipated subject. It had been for some time passing offensive urine, in the course of time always preceded by cries of distress, and in time leading to inflammation of the genitalia, when at the age of about a year it became very seriously ill, getting better after a mass of living maggots had been discovered in its napkin. After this, however, its distress before micturition continued, and maggots were frequently found in its bed and its napkins. No maggots were passed after the infant was at length put under proper observation in hospital. The maggots were identified as *Fannia canicularis* and *Musca domestica*. The author emphasizes the constipation and the crying-out before the act of micturition. [He appears not to recognize the significance of the extensive inflammation in the neighbourhood of the genitalia as a suitable lodging, under cover of napkins damp with offensive urine, for eggs and maggots. Again the crying-out *before* micturition may very well be explained as anticipatory of the pain associated with the immediate and inevitable consequences following the act, when hot acrid urine floods an inflamed surface around the genitalia.] In the second supposed case the material—many fly-eggs and a few well-grown maggots preserved in formalin—was sent by a doctor who stated that they were found on the napkins (wet with urine, but not soiled with faeces) of a sick baby girl. The maggots

were supposed to be *Musca domestica*. The author emphasizes the presence of well-grown maggots as well as eggs, and the absence of faecal matter.

The paper also contains some brief reference to previous cases of intestinal myiasis, and gives some particulars of a fresh case. The patient, a woman of 38, had suffered intensely from prurigo ani for about twelve months. The bowels were alternately constipated and loose, and the stools almost black. Dipterous larvae were passed after treatment with santonin and a specimen brought to the author was identified as probably a Syrphid.

A. A.

Franchini (Giuseppe). Un nuovo caso di myiasi intestinale. [**A Further Case of Intestinal Myiasis.**]—*Riforma Med.* 1927. Jan. 31. Vol. 43. No. 5. p. 102. With 1 text fig.

The patient, a man of 25 years, had suffered for two years, at intervals, from pruritus ani, abdominal pain, and loose mucoid and at times bloodstained stools. All treatment was ineffectual until the discovery of larvae identified as *Muscina stabulans*, when stovarsol effected a cure. It is conjectured that ova or young larvae were ingested with food, or may have entered *per anum*.

H. Harold Scott.

Bedford (G. A. H.). **Check-List of the Muscidae and Oestridae which cause Myiasis in Man and Animals in South Africa.**—*11th & 12th Reports Director Vet. Education & Res.* Dept. of Agric. Union of S. Africa. Part I. 1926. Sept. pp. 483–491. [14 refs.]

——. **A Check-List and Host-List of the External Parasites found on South African Mammalia, Aves, and Reptilia.**—*Ibid.* pp. 704–817.

The useful records must at the moment be—and indeed are admitted to be—incomplete, but their value and utility is unquestionable. Of course, they cannot be abstracted to any good purpose. Among the Muscidae recorded as causing intestinal trouble in man the only unusual entry to be noticed is the larva of *Stomoxys calcitrans*.

A. A.

Hadwen (S.). **Notes on the Life History of** *Oedemagena tarandi* **L. and** *Cephenomyia trompe* **Modeer.**—*Jl. Parasit.* 1926. Sept. Vol. 13. No. 1. pp. 56–65. With 2 text figs. [5 refs.]

Oedemagina tarandi is the warble-fly of the reindeer, and *Cephenomyia trompe* is a cognate Oestrid whose maggot is parasitic in the naso-pharynx of the reindeer. A few words on the habits of these Oestrids may be of interest to medical men. The adult flies in both cases can make long flights. Oedemagena is oviparous, and lays eggs, in great number, on the under-fur of its host; the young larvae pierce the skin and migrate in the course of several weeks to the subcutaneous tissue of the back, whence they ultimately escape, through the skin, to pupate; the larvae grow at a regular rate throughout the year (or thereabout) of their stay in their host: yearling reindeer suffer most to attack, older reindeer gradually acquire immunity, which, however, seems to be lost again in old age. Cephenomyia is viviparous;

its larvae make very little growth during the winter months, but grow rapidly in the spring of the year ; old reindeer are more resistant than young animals.

A. A.

Musconi (L.). [L'accrescimento delle larve di mosca (*Calliphora critrocephala*) in rapporto con la temperatura e l'alimentazione.] [**The Growth of Fly Larvae** (*C. erythrocephala*) **in Relation to Temperature and Food.**] —*Boll. Lab. Zool. gen. agrar. R. Scuola sup. Agric.* Portici. 1925. Vol. 18. pp. 95–115. With 8 figs. [18 refs.] [Summarized in *Rev. Applied Entom.* 1926. Sept. Vol. 14. Ser. B. Pt. 9. p. 153.]

The summarized account is as follows :—

" Larvae of *Calliphora erythrocephala* are able to live and grow between a minimum temperature of 4°–5° C. [39·2°–41° F.] and a maximum of 40°–41° C. [104°–105·8° F.]. At 0° C. [32° F.] the eggs do not develop, but are not killed and hatch if placed in a higher temperature after 3–4 days. It is possible to stop the feeding of a larva before it reaches natural size, and this does not prevent pupation. The limit of size varies with the temperature. By increasing the temperature the limit reached very closely approximates to the length that the larva would have attained if it had not been deprived of food. At a high temperature the larva eats only spontaneously for the necessary time, but at low ones it eats more than is needed for pupation. The resulting adult is smaller the higher the temperature."

A. A.

Cousin (G.). Sur le retard de la nymphose. La limite extrême du jeûne et la réalimentation possible des larves de *Calliphora erythrocephala*. [**On Delayed Pupation. The Extreme Limit of Fast with Possible Recovery for Larvae of** *Calliphora erythrocephala*.]—*C.R. Soc. Biol.* 1926. Sept. 21. Vol. 95. No. 27. pp. 601–603. [2 refs.]

Normally at a temperature of 18° to 20° C. the larvae of *Calliphora erythrocephala* pass into a state of torpor 3 or 4 days before pupation. Normally this prepupal torpidity lasts for 3 or 4 days, but its onset and duration may be much modified experimentally, and this holds good not only for the normal larvae but also for the larvae prematurely dwarfed by starvation. The onset of torpor may be delayed by keeping the larvae in their pabulum, by flooding their pabulum, or by keeping them exposed to the light, and the duration of the torpid stage may be prolonged by abrupt lowering or raising of the temperature. Thus under appropriate experimental conditions one can have larvae 10 to 15 days old which either may be full grown or may be dwarfs that were fed for only the first two days of their life.

Experimenting with larvae that were kept fasting from the second day of their life, the author found that in a slightly humid atmosphere they pupated in about 4 days. If, however, when pupation was imminent, such starved larvae were, without any change of temperature and humidity, placed on food, they began to feed at once and continued feeding for 6 or 7 days. Or, if such starved larvae were kept in bright light, at a temperature of 18°–23° C., such of them as survived 15 days of this treatment began to feed when at last they were supplied with food in a favourable temperature, and afterwards continued

their development, though slowly. On the other hand if normal larvae approaching maturity are deprived of food for *three* days, and are then supplied with food they do not touch it but proceed to pupate.

A. A.

Jobling (B.). **A Comparative Study of the Structure of the Head and Mouth Parts in the Hippoboscidae (Diptera pupipara).**— *Parasitology.* 1926. Sept. Vol. 18. No. 3. pp. 319–349. With 4 text figs. & 49 figs. on 5 plates. [25 refs.]

This is a fine anatomical study based on *Lynchia maura* (the Hippoboscid parasite of the pigeon) and interpreted by comparisons with numerous other Hippoboscid species, particularly *Melophagus ovinus* (the sheep ked). The features of the integument are noticed, and the head-capsule, the antennae, and all the mouth structures and their muscles are described in detail (with abundant illustrative figures) of which a summary is not feasible.

A. A.

Herms (W. B.). **Hippelates Flies and Certain other Pests of the Coachella Valley, California.**— *Jl. Econom. Entom.* 1926. Oct. Vol. 19. No. 5. pp. 692–695. [2 refs.]

The small Chloropid (Oscinid) fly, *Hippelates flavipes*, known locally as "buzz gnat" (and elsewhere as the "eye fly") causes perpetual annoyance at certain seasons by hovering round the eyelids. In the Coachella Valley, where "pink-eye" conjunctivitis is extremely common, it is believed to be concerned in spreading the infection mechanically.

Another pest in this valley is the "black widow" spider, *Lathrodectes mactans*, more feared for its bite than the rattlesnake. A local "physician stated that there had been one fatal case of spider-bite and several others had been bitten with very grave results."

A. A.

Lloyd (Llewellyn). **Report of the Tsetse Investigation, 1925.**— *Nigeria Ann. Med. & San. Rep. 1925.* Appendix E. pp. 99–106.

An experiment on the effect of excluding large game from a tsetse-fly infested tract of country half a square mile in extent was carried out; the full report of the experiment is to be published in the *Bulletin of Entomological Research* and will be noticed here when it appears. Attempts to study the effects of postponed grass-burning were frustrated, owing to native disobedience of their Emir's orders; another attempt is being made in 20 square miles of country placed under guard. An attempt at large-scale clearings is to be made during the months when labour is available. One dangerously infested pool close to a main road was cleared of about 200 acres of forest with the result of freeing a long stretch of the road from tsetse; and further clearings in other places, carried out during the dry season, have had satisfactory results in repressing fly.

In the treatment of sleeping-sickness, tryparsamide, which seems to give better results in advanced cases, has been used as well as "Bayer 205." Of 4 cases treated with the latter drug soon after the onset of the disease, one has remained perfectly fit for 37 months and three for 27 months following treatment; in a fifth case, treated at the onset with

" Bayer 205 " in succession to tartar emetic and tryparsamide, the patient remained well for about 16 months and then had a relapse having the appearance of a fresh infection ; for this he received the normal " Bayer 205 " course and again remained perfectly fit for a year, when he again relapsed and again responded to " Bayer 205 " like an early case. A. A.

Golov (D.) & Ioff (I.). Puces de spermophiles porteuses de l'infection pesteuse durant l'hiver. [**Spermophile Fleas harbouring Plague Infection during Winter.**]—*Rev. Microbiol. et Epidémiol.* 1926. Vol. 5. No. 4. French summary pp. 329–331. [In Russian pp. 239–248.]

The fleas of the souslik (Spermophilus) are active enough on the hibernating host, but in the absence of a host they hibernate in the vacant burrow and can go without food for at least ten months. The plague bacillus lives long enough in these starving fleas—without decrease of virulence—to conserve the infection from one seasonal epidemic to another. These conclusions appear to apply to all three species of fleas—*Ceratophyllus tesquorum*, *Ctenophthalmus breviatus*, and *Neopsylla setosa*—that infest the souslik. A. A.

Connal (Andrew). **The Rodents of Lagos and their Ecto-Parasites with Reference to Plague.**—*Ann. Trop. Med. & Parasit.* 1926. Dec. 17. Vol. 20. No. 4. pp. 341–353. With 1 chart & 1 map.

The analysis includes 167,194 rodents with 1,529 ecto-parasites. The rodents are *Mus musculus*, *Rattus rattus*, *Rattus norvegicus*, *Lemniscomys fasciatus*, and *Crieetomys gambianus* (and with these the Insectivore, *Crocidura manni*). The ectoparasites are *Xenopsylla cheopis* and *brasiliensis*, *Ctenocephalus canis* and *Laelaps echidninus*. A. A.

Boycott (A. A.). **The Reaction to Flea Bites.** [Correspondence.]—*Nature.* 1926. Oct. 23. Vol. 118. No. 2973. p. 591.

Boycott, who himself is naturally immune to flea-bite, though not to midges and mosquitoes, is of opinion that the irritating wheals that commonly follow the bites of insects are due to anaphylaxis. He instances the case of a lady who reacted severely to the bite of *Pulex irritans*, but not to that of *Xenopsylla cheopis* until after being bitten five times during six weeks—and similarly with the rabbit flea, *Spilopsyllus cuniculi*. He remarks the reluctance of the rabbit flea to bite man, and notices the deliberation with which it feeds, sometimes remaining attached for an hour if not disturbed.

A. A.

Peacock (A. D.). **The Reaction to Flea Bites: Anaphylaxis and Louse Infestation.** [Correspondence.]—*Nature.* 1926. Nov. 13. Vol. 118. No. 2976. p. 696.

From his experience with the American Trench Fever Commission the author gives an instance of anaphylactic manifestations in a volunteer who was injected with filtered extract of louse-excrement subsequent to an employment as " foster nurse " to clean lice.

A. A.

Uribe (Cesar). **On the Biology and Life History of *Rhodnius prolixus* Stahl.**—*Jl. Parasit.* 1926. Dec. Vol. 13. No. 2. pp. 129–136. With 14 figs. on 1 plate. [8 refs.]

The observations here recorded were made at Valera in Venezuela, where *Rhodnius prolixus* is very common up to 1,300 metres. The species is there believed to be strictly a house-bug; houses sometimes have to be abandoned, so badly may they be infested. "one wonders how people can live among swarms of such reputably dangerous insects, and still appear to be in good health, as good health goes in this climate." When a house is deserted the insects migrate, either by flight or in baggage. The author found the bite painless. He describes the development of the insect and states that in his local laboratory *R. prolixus* took an average of 200 days to grow from egg to adult. He kept a female alive for about 7 months, after it had received a single feed. Larvae also can fast for weeks, and he kept one third-stage larva alive for 5 months without food. Though he put new-hatched larvae that had been starved for two weeks in company with replete larvae and nymphs, he never observed cannibalism; on two occasions, however, he saw the starved larvae feeding on the faeces of the nymphs and older larvae—and this latter proceeding, if it be a habit in nature, may account for the spread of *Trypanosoma cruzi* infection. A high percentage of larvae, and a still higher percentage of adults, collected in houses in two towns were found naturally infected with *T. cruzi*.

A. A.

Larrousse (F.). Etude biologique et systématique du genre *Rhodnius* Stal (Hémiptères, *Reduviidae*). **Bionomy and Taxonomy of the Genus *Rhodnius*.**—*Ann. Parasit. Humaine et Comparée.* 1927. Jan. 1. Vol. 5. No. 1. pp. 63–88. With 9 text figs. [28 refs.]

The author includes four genera among the blood-sucking Reduviidae, and comments on the fact that they also are coprophagous and cannibalist. He treats the genus *Rhodnius* in specific detail, with nice figures. Two species of *Rhodnius* (as well as species of the kindred genera *Triatoma* and *Eratyrus*) are intermediaries in the spread of *Trypanosoma cruzi*. Six species of Rhodnius are known, all except *R. brethesi* being nocturnal in habit; their collective range is limited to Central and South America.

The following diagnostic table of the bloodsucking Reduviidae presented by the author may be useful:—

Family Reduviidae = Subfamily Acanthaspinae

Anterior disk of thorax armed with spines, its posterior angles spinous or well pronounced ... ... Eratyrus

Anterior disk of thorax without spines, its posterior angles rounded or obtusely prominent 2

2 { Antennae attached near apex of head; femora unarmed; connexivum narrow beneath ... ... Rhodnius
{ Antennae not attached to apex of head; femora armed beneath; connexivum broad 3

3 { Body generally smooth; thorax little contracted; connexivum little broadened ... ... Triatoma (= Conorhinus)
{ Body strongly pilose; thorax much contracted; connexivum very broad ... ... Meccus

A. A.

Tejera (E.). Les blattes envisagées comme agents de dissémination des germes pathogènes. [**Cockroaches as Distributors of Pathogenic Germs.**]—*C. R. Soc. Biol.* 1926. Dec. 3. Vol. 95. No. 35. pp. 1382–1384.

The author gives us a familiar catalogue of protozoa and other micro-organisms inhabiting the intestine of the domestic cockroaches, and adds instances of his own observation of the ability of these insects to entertain and to transmit in their faeces micro-organisms pathogenous to man—Giardia, Balantidium, the dysentery amoeba, and the bacilli of cholera, dysentery, leprosy, and tuberculosis—all alive and active. He therefore joins in the cry against the cockroach as a dangerous insect.

A. A.

Morischita (Kaoru) & Tsuchimochi (Katsuji). **Experimental Observations on the Dissemination of Disease by Cockroaches in Formosa.** -*Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1926. June. No. 255. English summary pp. 2–6. [In Japanese.]

The house cockroaches of Formosa are *Periplaneta americana* and *australasiae* and *Dorylaea rhombifolia*. The authors have made numerous feeding experiments with them and find that various pathogenous bacteria (typhoid, dysentery, cholera), Entamoeba cysts, and eggs of worms (Ascaris, Trichuris, and hookworm) pass through them unchanged and unharmed. The organisms do not, however, survive the passage long unless the faeces are passed in moist places.

A. A.

Senevet (G.) & Rossi (P.). *Ixodes ricinus*, tique des régions froides ou tempérées. [*Ixodes ricinus*, **a Tick of Cold or Temperate Regions.**]—*Bull. Soc. Path. Exot.* 1926. July 7. Vol. 19. No. 7. pp. 558–560. [3 refs.]

Considering it to be interesting from a pathological standpoint to have accurate information as to the geographical distribution of *Ixodes ricinus*, the authors have collected, and now publish, a list of all the places in the world where this tick has been observed. Their conclusion is that *I. ricinus* is essentially a tick of cold and temperate regions, north of 40°; that in more southerly regions, as far as the tropic, where it can develop only in winter, it is comparatively rare; and that in the intertropical zone its presence is exceptional.

A. A.

Klein (L.). **Ear Bushticks as a Human Parasite.** [Correspondence.]—*Jl. Med. Assoc. S. Africa.* 1927. Jan. 8. Vol. 1. No. 1. p. 24.

For ticks in the ear the author recommends filling the meatus with "dioxygen" for 10 to 15 minutes and syringing out the then dead tick with warm water.

A. A.

i. Beselin (Oskar). Lebende Nymphe einer Ohrzecke (*Otiobius Megnini*) im Gehörgang einer aus Bolivien zugereisten Patientin. [**Living Nymphs of a Tick in the Ear Passage of a Patient from Bolivia.**] *Arch. f. Schiffs- u. Trop.-Hyg.* 1927. Jan. Vol. 31. No. 1. pp. 44–45. [3 refs.]

ii. Loubser (Johannes N. W.). Ueber Ohrzecken (*Ornithodorus megnini*) bei Menschen in Süd-Afrika. [**Ear Ticks in Man in S. Africa.**]—*Ibid.* p. 45.

i. Records an instance of infestation of the external ear-passage by *Ornithodorus* (=*Otobius*) *megninii*. The patient was a woman, in Hamburg, who had lately come from Bolivia. The tick was extracted alive.

ii. The writer states that *Ornithodorus megninii* quite often gets into the ear-passage of man in South Africa; the tick may be either loose or attached; in all his own cases it was replete, and being loose could be washed out with a syringe and warm water.

A. A.

Mekie (Eric C.). **Parasitic Infection of the Urinary Tract. Report of a Case of Infection of the Urinary Tract by Acari, together with an Analysis of previously Reported Cases.**—*Edinburgh Med. Jl.* 1926. Dec. New Ser. Vol. 33. No. 12. pp. 708–719. With 1 text fig. [8 refs.]

The finding of mites and their eggs in abnormal urine and the inference that they may be the actual cause of cystitis and irritation of the urinary tract has been a subject of some controversy, and Mackenzie (this *Bulletin*, Vol. 21, p. 155) after considerable experience and some hesitancy, expressed the opinion that the mites might be derived—as he actually demonstrated in certain instances—from the hay and straw in which glass-vessels used in the laboratory are packed. In the present paper Mekie, in describing a case of infestation of the urinary tract by mites, has analysed a considerable series of similar cases recorded by other observers (Mackenzie included), and comes to the conclusion that Mackenzie's explanation is not all-sufficient. Mekie's own well-considered conclusions are :—

"(1) That the urinary tract is liable to become infected by certain members of the Arachnida species; (2) that the result is a clinical picture suggesting irritation of the urinary tract and that one of the commonest symptoms is nocturnal enuresis; (3) that the urine frequently contains large sheets of epithelial cells; (4) that the presence of acari in the urine can only be assumed to indicate true endoparasitism in those cases in which they are found repeatedly and when careful precautions have been taken against contamination; (5) that a secondary micro-organismal infection of the urinary tract is liable to occur."

In the present instance the patient was a woman of 32 years, who for 16 years had suffered from slight discomfort at micturition, occasional nocturnal enuresis, and an intermittent discharge from the urethra. The urine from the beginning had been discoloured; the intervention of Venus was denied. Eventually, becoming acutely ill, she came under observation with symptoms that justified a diagnosis of acute appendicitis. At operation, however, the right kidney was discovered to

be inflamed, and the appendix being healthy—the diagnosis was changed to pyelitis.

The urine contained numerous blood corpuscles, pus cells, and many epithelium cells both single and in clumps, and a number of mites—identified by HIRST as Tarsonemus, Glycyphagus, and Tyroglyphus—also eggs, identified by HIRST as Tyroglyphus. Such a medley of species naturally prejudiced any hasty conclusions, so that the bladder was cystoscoped, and the urine both from ureters and bladder was very cautiously collected and methodically investigated for a considerable term. At the beginning of this investigation no mites or ova were found, though plenty of epithelium masses, pus cells and blood corpuscles were present; but later on Tyroglyphus was observed both in the morning urine and in catheter urine taken "with the strictest care" and avoidance of "all chance of contamination." It may be mentioned (1) that the bladder was normal, and (2) that slight growths of *Bacillus coli* were cultivated from the urine both of bladder and from both ureters. The author emphasizes the presence of masses and sheets of epithelium, as well as the fact that the mites are found in the urine not constantly but with intermittence.

A. A.

GAY (D. M.) & BRANCH (Arnold). **Pulmonary Acariasis in Monkeys.**—*Amer. Jl. Trop. Med.* 1927. Jan. Vol. 7. No. 1. pp. 49–55. With 3 figs. [10 refs.]

Pulmonary acariasis is a chronic affection due to infestation of the lungs by mites of the genus *Pneumonyssus*. The mites are found encapsulated in lesions somewhat suggestive of tubercles. The authors here give a general description of 20 cases detected post-mortem in 25 common Macacus monkeys whose death was due, not to infestation with Pneumonyssus, but to enterocolitis or to tuberculosis. In these 20 cases the acari are described as being encapsulated in contiguity to bronchi though no previous communication with a bronchus could be discovered in any instance. The authors characterize the infestation as benign.

A. A.

VAN THIEL (P. H.). Eine ungelöste Porozephalusfrage. [**An Unsettled Porocephalus-Phenomenon.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Sept. 13. Vol. 30. No. 9. pp. 585–594. [17 refs.]

Immature forms—larvae and nymphs—of Linguatulids are sometimes found alive and locomotive in the gut and body-cavity of man and other animals, and are commonly supposed to have escaped from cysts that have been swallowed in the flesh of some other species of animal (food). This explanation is not always convincing. As an alternative explanation the author draws attention to the fact that pleurocercoids of a species of ribbon worm, *Triaenophorus nodosus*, whose intermediary host is the perch and final host the pike, are known to be able to excyst in the perch, and he inclines towards a possible analogy in the case of Linguatulids—to wit, that they may excyst in the individual animal in which they encysted.

A. A.

Heymons (R.). Ein Borstenwurm (Oligochät) als angeblicher Insasse des menschlichen Körpers. '**An Oligochaete as an Alleged Inmate of the Human Body.**'—*Cent. f. Bakt.* I. Abt. Orig. 1926. July 6. Vol. 99. No. 1-3. pp. 153–156.

The subject of this essay is *Pachydrilus* (= *Lumbriculus*) *lineatus* a little yellowish Oligochaete worm about half-an-inch long, commonly found in fresh water. Two specimens, passed on separate occasions alive, from a patient in Berlin, were brought to the author's notice. The author would not have regarded the matter very seriously had he not afterwards heard of two other cases occurring in Hamburg. Considering the adaptability of this little freshwater Oligochaete to salt water, to brine pools, to all kinds of foul water, even to water polluted with chemical refuse—the author is now inclined to think that it might also make itself at home in the human intestine. He notes that Blanchard has included Oligochaetes, though not this particular species, among the pseudoparasites of man.

A. A.

Müller (Reiner). Borstenwürmer im menschlichen Körper (*Pachydrilus lineatus*). '**Bristle Worms in the Human Body.**'—*Cent. f. Bakt.* I. Abt. Orig. 1926. Dec. 7. Vol. 101. No. 1/3. pp. 151–155. With 1 text fig. [22 refs.]

The author refutes the opinion expressed in 1926 by R. Heymons, that the Oligochaete worm *Pachydrilus lineatus* cannot live in man's intestine. He refers to a case, in 1922, where a man who had been suffering from abdominal troubles was relieved when he had passed a multitude of living Oligochaetes of this species. He also gives a copious extract from the record of cases where worms and numerous other kinds of animal life—maggots, beetles, mites, etc.—have been discharged, alive, from the human gut.

A. A.

Germain (L.) & Neveu-Lemaire (M.). Essai de malacologie médicale. '**Medical Malacology.**'—*Ann. Parasit. Humaine et Comparée.* 1926. July 1 & Oct. 1. Vol. 4. Nos. 3 & 4. pp. 286–305; 352–384. With 16 text figs. [62 refs.]

The Mollusca of this paper belong to the Class Gasteropoda, two Orders of which—Prosobranchiata and Pulmonata—furnish intermediary hosts for trematode parasites of man. Definitions are given of the class and of the relevant orders, suborders, families, genera, and species; these definitions being conveniently supplemented by some dichotomous keys and a considerable number of text-figures.

In their conclusions the authors express the opinion that, although (with rare and unverified exceptions) a specific trematode larva is restricted to one particular *order* of Gastropods in the choice of an intermediary host, the doctrine that a specific larva has an exclusive affinity for a particular *species* of intermediary mollusk is not so absolute as has been thought.

A. A.

Walton (C. L.) & Wright (W. Rees). **Hydrogen-ion Concentration and the Distribution of *Limnaea truncatula* and *L. peregra*, with a Note bearing on Mosquitoes.**—*Parasitology.* 1926. Dec. Vol. 18. No. 4. pp. 363–367. [5 refs.]

Limnaea truncatula in these observations in North Wales occurs over a range of pH 6 to 8·6, *L. peregra* over a range of 5·8 to 8·8, and *L. palustris* (only 3 observations) through a range of 7·4 to 8. The observers therefore are of opinion that hydrogen-ion concentration is not of vital importance for these animals. Moreover, since they found that larvae of *Culex pipiens* could tolerate water at pH 4, 7·5, and 9+, and larvae of *Anopheles maculipennis* at pH 4+, 7·5, and 10+, and also were unable to confirm MacGregor's experiments [this *Bulletin*, Vol. 19, p. 476], they think that the H ion concentration of the medium cannot be of much importance for mosquito larvae. Their opinion is supported by evidence quoted from observers in other parts of the world.

A. A.

Sepulcri (Piero). La scardola comune (varietà piccola) nella lotta antimalarica. [**The Common Fish "Scardola" (Little Variety) in Antimalaria Work.**]—*Riv. di Malariologia.* 1926. Sept.–Dec. Vol. 5. No. 5–6. pp. 663–675. With 5 text figs. [English summary p. 739.]

The author extols the "little variety" of the "Scardola" [the rudd (*Leuciscus erythrophthalmus*) a near relative of the minnow] for the destruction of anopheles larvae in Europe.

A. A.

Johns (F. M.). **A Method for the Routine Examination of Feces for the Ova of Parasitic Worms and Encysted Amebas.** *New Orleans Med. & Surg. Jl.* 1926. Sept. Vol. 79. No. 3. pp. 218–221. With 10 figs.

The method recommended is the repeated centrifugation, after straining, of a watery emulsion of faeces.

A. A.

Banchieri (E.). Azione del veleno di cobra sull' attività di corpo intermedio (mittelstuk) del liquido cefalo rachidiana.—*Pathologica.* 1927. Feb. 15. Vol. 19. No. 424. pp. 65–67.

Taliaferro (W. H.). Infection and Resistance in Trypanosome Infections: Studies on the Reproduction-Inhibiting Reaction Product in Infections with *Trypanosoma lewisi.*—*Proc. Inst. Med. Chicago, 1925.* 4 pp. [3 refs.]

TROPICAL DERMATOLOGY.

SARTORY (A.) & SARTORY (R.). Les teignes exotiques. [**Tropical Ringworms.**]—*Rev. Prat. Malad. des Pays Chauds.* 1926. July. Year 5. Vol. 6. No. 5. pp. 265–276. [1 ref.]

Dermatomycoses are very common in warm countries, especially ringworm of the scalp, herpes circinata and kerion of Celsus. On the west coast of Africa young natives are found infected with *Trichophyton tonsurans* or *Microsporum audouini*. In addition there are numerous other parasites, many of them new species, some of which have been identified, but others are as yet undescribed.

Of the genus *Trichophyton*, the following species occur in warm countries. *T. violaceum*, Sabouraud 1893, is common in Senegal and Brazil. *T. soudanense*, Joyeux 1912, causes tinea of the scalp, especially of children, in the Soudan. *T. balcaneum*, Castellani, one of the rarest species, was isolated from tinea of the scalp of an adult in Macedonia. *T. nodoformans* is found in Ceylon in cases of sycosis and "dhobi itch." *T. luxurians*, Braul & Viquier, a large-spored ectothrix with faviform cultures, was isolated from typical "kérion" in two children in Algeria. *T. albiciscans* was isolated by NIEWENIUS in 1907 in Java and Siam from cases of "tinea albigena." *T. castellani* was described by CASTELLANI in cases of "tinea intersecta" in Ceylon, but has not been cultivated. *T. ceylonense* causing "tinea nigro-circinata" in Ceylon, has been described by the same author, but was not cultivated. *T. exsiccatum* was obtained from child ringworm in Buenos Ayres by URIBURU in 1909; who also noted an endothrix ringworm, cultures of which were first crateriform and later polygonal and powdery. *T. sp.*, isolated by COURMANT from the head of a child in Senegal, is an endothrix with polymorphic and polychromatic cultures, which are cupuliform and straw yellow. *T. multicolor*, Neves and Magalhaes, from tinea of the scalp of a child, has cerebriform colonies. In 1925 DA FONSECA described a dermatitis among Indians which may affect all the members of a tribe, caused by a fungus culturally resembling Epidermophyton. DE MELLO and PAES in a case of tinea of the scalp of a negro child, found a large-spored endothrix with chocolate coloured, faviform cultures.

Microsporums, other than *M. audouini* are rare. HORTA in 1925 incompletely described a Microsporum causing herpes circinata of the neck, with quickly growing, yellowish cultures. *M. circulus centrum*, De Magalhaes, from tinea of the scalp of an infant in Rio Grande dos Sul (Brazil), has a variable cultural aspect. *M. ramos*, Horta 1924, was found in two cases of tinea of the scalp.

Epidermophyton cruris causes eczema marginatum which is common in both temperate and tropical zones. *E. rubrum*, Castellani 1910, causes "tinea cruris." *E. perneti* is rare in Ceylon.

In the group *Endodermophyton* is mentioned the parasite of "tokelau" or "tinea imbricata," first met with in the Malayan Archipelago, and which spread to the islands of the Eastern Pacific and is widely distributed in French Indo-China. TRIBONDEAU in 1901, described

the parasite as an Aspergillus under the name *Lepidophyton* ; and this was confirmed by Jeanselme, Wehmer and Dubreuilh. Wehmer found distinct Aspergillus fructifications and established definitely the species *Aspergillus lepidophyton*. Castellani nearly always found the same fungus, a sterile form, in "tokelau," and also isolated *E. indicum* from the same tinea, with which the inoculation to man is positive.

Achorions are scarcely known in hot countries. *A. gallinae* was isolated by the authors and Peteges of Bordeaux, from a case of ringworm contracted in the French colonies.

P. Tate.

Ota (Masao). Sur quelques champignons pathogènes du type *Trichosporum beigeli* Vuillemin. [**Pathogenic Fungi of the Type of *T. beigeli* Vuillemin.**]—*Ann. Parasit. Humaine et Comparée.* 1926. Jan. Vol. 4. No. 1. pp. 1-13. With 3 text figs. [11 refs.]

The genus *Trichosporum* Behrend 1890, contains the species *T. beigeli* Vuillemin 1901, isolated from cases of tinea nodosa. *T. giganteum* Behrend 1890, causing "piedra" of Colombia, *T. ovoides* Behrend 1890 and *T. ovale* Unna 1896, which are all parasitic on the surface of hairs. The genus has two forms of sporulation, one by blastospores and the other by arthrospores. It is thus intermediate between the Blastospores and Arthrospores of Vuillemin ; and the author suggests reserving the term Blastospores for the forms developing only by blastospores, and enlarging the Arthrospores to include forms producing both blastospores and arthrospores in addition to those with arthrospores only.

It is considered that the following forms also fall within the genus Trichosporum : *Mycoderma cutaneum* de Beurmann, Gougerot & Vaucher 1919, *Parendomyces asteroides* Rischin 1921, *P. balzeri* [Bakzer Burnier & Gougerot 1911], *Hemispora rugosa* [Castellani 1910], *Oospora perieri* Matruchot & Antoine 1917, *Oidium pullulans* Lindner—non-pathogenic. All of these show yeast, oidial, mycelium, and chlamydospore forms. The yeast is the principal cultural form, and generally one polar bud is produced, but a second bud at the same or at the opposite pole, and, rarely, a third bud, may be formed. The oidial is less frequent and arises either by a spore giving rise directly to a closely septate mycelium or by a spore giving rise to a chain of blastospores in one of which transverse walls are formed. Mycelium is formed when development is vigorous and may arise directly from an initial spore or by the elongation of the cells of a chain of blastospores. It soon becomes divided up into chains of arthrospores. The chlamydospores are protoplasmic condensations surrounded by thick membranes. Pseudo-conidia may be formed through buds arising on the flank of mycelial filaments with or without denticulations at their point of insertion.

On the same medium the cultures of the different species are identical ; and none ferments glucose, maltose, saccharose or levulose.

P. Tate.

Popov (P.). [**A Case of Trichonocardiasis in Armenia.**]—*Russian Jl. Trop. Med.* 1926. Nos. 6–7. pp. 59–61. With 2 text figs. [7 refs.] [In Russian.]

A case of trichonocardiasis was observed by the author in Armenia. The condition is referred to as Tinea flava, and was caused by *Nocardia* [*Discomyces*] *tenuis*. The affected hairs were in the right axilla and had turned yellow, those in the left axilla and on other parts of the body being black.

C. A. Hoare.

Silva (Flaviano). Considerações em torno de um caso de "Purú-Purú." [**Discussion on a Case of Purú-Purú.**]—*Brazil-Medico.* 1926. Aug. 28. Year 40. Vol. 2. No. 9. pp. 113–119. With 4 text figs.

This interesting paper describes a case of Purú-Purú and discusses the diagnosis and nature of the condition. The patient was a married woman, 32 years of age, who a year previously had raised a callosity on her right hand from grating cassava. This became inflamed and pustular and she opened it with a piece of orange-stick (espinho de laranjeira). Later, there appeared at this site a white spot the size of a pin's head, which spread, accompanied with intense itching. When seen by the author there were achromic areas contrasting with others hyperpigmented on both hands and feet. They were 1–2 mm. in size individually, but coalesced to involve considerable areas, as seen by the very clear illustrations. Some in an early stage were slightly scaly.

The diagnosis between this and vitiligo, pityriasis (in which the hands and feet escape), the Tinea alba of Ceylon, Tinea albigena of Indo-China, Java, and elsewhere, Cryptococcosis epidermica of Castellani, is discussed and each dismissed in turn as differing in some essentials from Purú-Purú. The disease most closely resembling it is Caraté or Pinto (though this also is rarely found on the hands or feet), and from the scales the author was able to cultivate a mould with the characters of Aspergillus, and he thinks that at the opening of the original pustule this had been inadvertently inoculated.

H. Harold Scott.

Onorato (Raffaele). I micetomi in Tripolitania. [**Mycetoma in Tripolitania.**]—*Arch. Ital. Sci. Med. Colon.* Tripoli. 1926. Jan.–Feb., Mar., Apr.–May, June, July–Aug. Vol. 7. Nos. 1–2, 3, 4–5, 6 & 7. pp. 1–8; 33–50; 65–83; 97–110; 137–152. [17 refs.]

This series of papers forms a valuable contribution to the elucidation of an intricate subject and might be published as a separate thesis or brochure with advantage.

The first part clears the ground by giving Carter's original definition of Mycetoma, followed by those of Pseudomycetoma and Paramycetoma by Chalmers and Archibald. To the latter, which Chalmers and Archibald have defined as Mycetoma without or with very sparse granules, the author would add "but always containing eosinophil or Russell bodies."

Though in favour on the whole of Castellani's classification, Onorato holds that the subdivision of maduromycoses according to country—

Asiatic, European, African, American—is weak and unscientific, and compares it to the name *Necator americanus* as misleading for a nematode coming from Africa. He suggests that a better classification than that according to colour of grains is one according to species as in the appended table, modified, as far as his cases exemplified, from the longer table set out in the first section. In the succeeding sections he gives detailed descriptions of 19 cases with the cultural findings where these were attempted and the results of inoculation-experiments. We cannot here relate the various cases, for details of which the original must be consulted, and they are well worth it, but they suffice to show that a variety of these infections occur in Tripolitania. Most of them appear to have been previously diagnosed erroneously as actinomycosis.

We may summarize the cases given by saying that of the 19 recorded, there were 11 infected by Micromycetoma, 6 by Hyphomycetoma, and 2 by Paramycetoma. Putting aside those with Paramycetoma and considering for purposes of drawing conclusions the remaining 17, we find (1) that *age* has no influence ; in succeeding decades there were 2, 3, 4, 3, 4, and 1 cases ; (2) as regards *sex*, more occurred among males, namely 14 to 3 females, but this is explained by the fact that the former were, from the nature of their work, more liable to small wounds, injuries and local infections ; (3) *Site* ; in 6 one or other foot was affected, in 5 the lower jaw, in 2 the face ; other sites were the vertebral column, the clavicle, and the vertex. The condition began generally as a small nodule, superficial or deep, gradually increased in extent and depth and, in the earlier stages, resembled a neoplasm, and was at times diagnosed as fibroma, sarcoma, chondrosarcoma, etc. Subsequently, smaller nodules developed, opening at the surface to discharge pus with granules, white, black, red or yellow. The course was a prolonged one, spontaneous cure never occurred ; the case recorded by Neveu-Lemaire in 1908, the author states, was probably not a true mycetoma, though he does not give his reasons for doubting it.

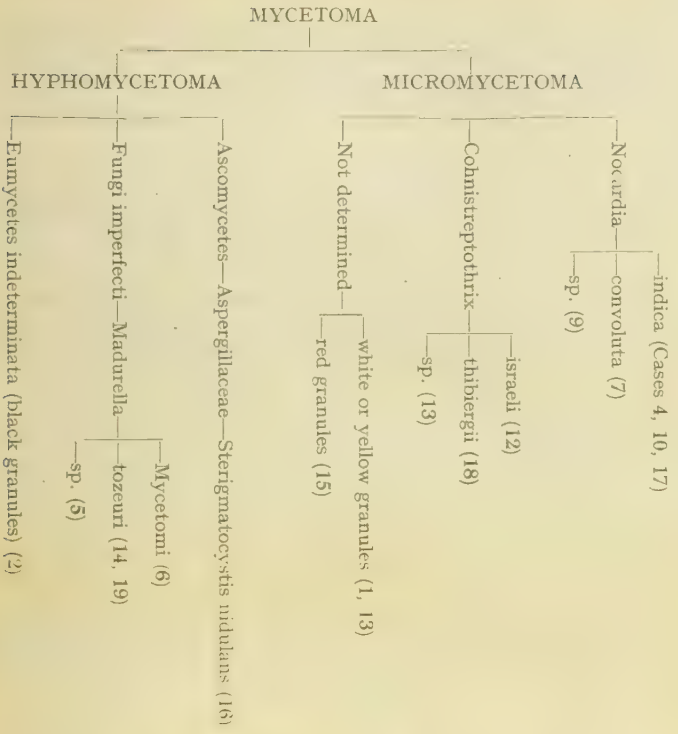
If left to itself, it invades muscles and bones. A description of the morbid anatomy and histology is given, agreeing largely with what is stated in modern text-books—the spreading amongst tendons and muscles and opening to the exterior by sinuses, the formation of cavities imperfectly lined by a sort of membrane made up of tissue detritus in which the cells are no longer recognizable, the destruction of the epiphyseal cartilages, rarefying osteitis and necrosis, and so on. Lastly, the presence of granules with mycelial filaments, surrounded by epithelioid cells, and in the paramycetomas the Russell bodies. Particularly noticeable is the absence of any true barrier to the advancement of the destructive process.

Infection arises from injury by splinters of wood, thorns, fragments of grasses, and suchlike on which the fungus is saprophytic.

There appears to be neither immunity nor predisposition, and prophylaxis consists in protecting the skin, especially that of the feet, from injury, and the prompt treatment of small wounds. The treatment of the condition itself is surgical, aided by the use of iodine as potassium iodide. Sometimes benefit seemed to result from injection into the sinuses of a suspension of iodoform in ether or in Ziehl's liquid as used for acid-fast staining, diluted 1 in 5.

Vaccine therapy, tried by Montpelier, is ineffectual.

H. Harold Scott.



Anderson (Ch.), Broc (R.) & Cassar. Deux nouvelles observations tunisiennes de mycétome. [**Two Fresh Tunisian Cases of Mycetoma.**]—*Arch. Inst. Pasteur de Tunis.* 1926. Dec. Vol. 15. No. 4. pp. 332–335. [3 refs.]

The first case of 10 years' duration, concerning an agricultural labourer, with the disease involving the entire right foot was due to *Scedosporium apiospermum*. The second case of some 3 months' duration, in a labourer, was an affection of the right foot about the metatarsophalangeal articulation of the big toe, the site of a previous injury. Accompanying the lesion of the foot was an enlarged gland in the corresponding Scarpa's triangle. Cultures from the case showed *Discomyces madurae*.

W. Jenkins Oliver.

Catanei (A.), Grosdemange (L.) & Legroux (Ch.). Sur un cas de mycétome du pied observé en Algérie. [**Case of Mycetoma of Foot seen in Algeria.**]—*Bull. Soc. Path. Exot.* 1927. Jan. 12. Vol. 20. No. 1. pp. 11–13. [2 refs.]

Report of a case of 7 years' duration in an Algerian native, in whom the condition had first shown itself while he was working in a factory in France some 4 months after leaving Algeria. The affection involved

practically all the tissues of the right foot which was amputated. Cultures of the white grains proved the infecting fungus to be *Nocardia madurae*. Lack of knowledge of the rate of penetration by the fungus prevents the determination of the date of infection.

W. J. O.

VAN HOOF (L.). Un cas d'actinomycose à grains blancs au Congo Belge. [**Case of Actinomycosis with White Grains from Belgian Congo.**]—*Ann. Soc. Belge de Méd. Trop.* 1926. Dec. Vol. 6. No. 3. pp. 225–226. With 1 text fig.

Case report of a native boy, aged 10–11 years, in whom the affection of one year's duration involved the lower jaw as a hard tumour, with softer lesions about the lateral aspects of the neck. The infection had followed caries of a left lower molar. Local and general iodine treatment proved unavailing. The fungus was cultured with difficulty, only under anaerobic conditions, from the small white grains in the pus. While the exact nature of the parasite could not be determined, it was considered to belong to a *Cohnistreptothrix* species, perhaps *C. thibiergei* (RAVAUT and PINOY). According to the writer's knowledge actinomycosis has not been reported previously in Belgian Congo.

W. J. O.

MONTPELLIER (J.) & CATANEI (A.). Blastomycose de l'avant-bras chez une femme indigène d'Alger. [**Blastomycosis of the Fore-Arm of a Native Woman of Algiers.**]—*Bull. Soc. Path. Exot.* 1926. July 7. Vol. 19. No. 7. pp. 586–592. With 2 text figs. [2 refs.]

The lesions, which were purely tegumentary, developed in three months from a plaque 6–8 cms. in diameter until the greater part of the posterior surface of the fore-arm was covered, in spite of general and local treatment with acetylarsan and yellow precipitate of mercury respectively. Histologically the lesions resembled diffuse sporotrichosis. The general health of the subject was not affected. Treatment with "néo-riodine" was very efficacious, and after the 10th intramuscular injection the lesions were quite healed.

Pure cultures of a yeast-like organism were repeatedly obtained on Sabouraud's medium from the pus. In culture it forms globular or ovoid budding yeast cells 2·5–8μ; elongated cells, 2–3μ × 9–16μ, united in twos or threes and sometimes bearing several terminal or lateral buds; and, under certain conditions, septate filaments, 2–3μ wide, simple or branched, bearing oval or lateral buds. It grows well on all ordinary media at laboratory temperature, but growth is much better at 37° C. Details of the growth in a number of fluid and solid media are given. On Sabouraud's glucose white shining colonies are formed. Gelatine and serum are not liquified. Milk is not coagulated, but is made alkaline in ten days. Glucose, levulose, saccharose, and dextrin are attacked; galactose, maltose, arabinose and xylose are slightly or not at all attacked; lactose, mannite, inulin and dulcite are not attacked. In no case is gas produced. The organism is provisionally placed in the genus *Cryptococcus* under the name *C. montpellieri* Catanei 1926.

Intravenous and intraperitoneal inoculations of rabbits with large quantities of culture were negative. Subcutaneous inoculation with young cultures, 1-3 days, were negative in rabbits and gave only slight local ganglion reaction in guineapigs, but old cultures, 11-43 days, even in small quantities, produced local abscesses, in the pus of which yeast cells were present and from which recultivation was positive. Similar results were obtained by inoculating subcutaneously with splinters coated with young, 24 hours', and old, 34 days', cultures. Subcutaneous inoculation of two rabbits with a 24 hours' and a 37 days' culture, previously heated to 60° C. for 30 minutes, resulted in abscess formation from which recultivation was positive. Inoculation of a rabbit and a guineapig with a 37 days' culture heated to 60° C. for one hour also produced abscesses, but recultivation was not possible.

A series of intravenous injections of the culture produced a high specific agglutinative power in the serum of the rabbit, but did not confer immunity against subcutaneous inoculation.

P. Tate.

Montel (R.) & Pons (R.). Dermatite blastomycosique chéloidienne. [**Keloid Blastomycotic Dermatitis.**]—*Bull. Soc. Path. Exot.* 1926. Dec. 8. Vol. 19. No. 10. pp. 876–880. With 2 text figs.

Two cases of a dermatitis, characterized by crateriform ulceration, intradermal nodules and, especially, by keloid cicatrices on healing, were observed at Saigon, Cochin China. A blastomycete was observed in the pus from unopened abscesses and was cultivated. In view of the blastomycotic origin and peculiar keloid cicatrices, this dermatitis is named "dermatite blastomycosique chéloidienne." In both cases the general health was good and the condition was of long duration, 3–19 years, gradually extending peripherally and healing spontaneously in the older central regions.

In the scales and pus numerous simple or budding, usually spherical, yeast-cells, 5–6 microns in diameter, were present. On Sabouraud's medium at 37°, the optimum temperature, shining, waxy colonies are formed. In cultures of ten days giant forms, up to 20 microns in diameter, are found. Some mycelium is also developed, but the hyphae rarely exceed 50–60 microns in length. Litmus milk is not coagulated, but is reddened at the surface. Horse serum is not liquefied. Acid, but not gas, is produced in levulose, glucose and maltose; lactose, mannite, dulcite and dextrine are not attacked.

Subcutaneous inoculation of rabbits with pus or the fungus, causes death in 6 days, with generalization and very marked congestion of the kidneys, from which recultivation of the fungus is possible.

P. Tate.

Smith (E. C.). **Prickly Heat: its Aetiology and Pathology.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1927. Jan. Vol. 20. Nos. 5 & 6. pp. 344-351. With 30 figs. (4 coloured) on 5 plates. [1 ref.]

This well illustrated communication explains prickly heat to be a dermatitis of mycotic origin, the infecting agent belonging to the Monilia group. Staining of the scales by Gram's method shows the fungus as a yeast-like budding organism (Gram positive) free or within the epidermal cells. Adamson's staining method gives better results as regards mycelial elements. On Sabouraud's medium cultures of the fungus should appear within six days as an opaque creamy-white

growth. Occasionally a variety of red lead colour may be observed. (The sugar reactions of the strains are shown in tabular form.) Inoculation experiments with the cultured fungus on the human skin are positive in 4 days if applied on lint and affixed in situ, and in 24–48 hours if rubbed directly into the skin. Histological examinations of such experimentally produced lesions show changes mainly in the epidermis, with (1) the presence of vesicles or pustules, (2) affection of the hair follicles. The vesicles may be situated in either the superficial or deep layers of the epidermis, while many are about the sweat ducts. Involvement of the hair follicle is confined to that part which passes through the epidermis. The affected follicles appear dilated, with the fungus present within or between the oedematous cells forming the sheath, and in the follicular epithelium. The hairs themselves and the ducts of the sebaceous glands appear to be free from infection. The fungus is most readily demonstrated in the sections by staining with Loeffler's methylene blue.

W. J. O.

Guillon (A.). Un nouveau traitement de l'ulcère tropical. [**New Treatment of Tropical Ulcer.**]—*Ann. de Méd. et de Pharm. Colon.* 1926. Oct.–Nov.–Dec. Vol. 24. No. 4. pp. 595–596. [1 ref.]

Direct freezing of the lesions with the ethyl chloride spray, performed three or four times at two days' intervals, produced an excellent result in the writer's case. It is suggested that carbon dioxide snow might be similarly employed. Such treatment is advocated in view of the good results obtained by this method in cases of ulcerative stomatitis of spirochaetal origin.

W. J. O.

de Bellard (E. P.). **Ulcus Tropicum.** *Gac. Med. de Caracas.* 1926. June 15. Vol. 33. No. 11. pp. 164–165.

The local treatment of ulcus tropicum recommended in this paper is carried out as follows: For two or three days, to obtain a perfectly clean surface, dressings of a saturated solution of magnesium sulphate are applied and renewed frequently. The ulcer is then painted once daily with pure essential oil of chenopodium, and left exposed to the air for half an hour. Next, a piece of sterilized gauze the size of the ulcer is applied and thinly covered with an ointment of protargol 10 per cent., or one made up of ichthyol gm. 10, balsam of Peru gm. 10, zinc oxide ointment gm. 80. During the night a bandage retains this in place, not during the daytime when the limb is raised and supported. Each morning after the first, before renewing the dressings, the secretions of the ulcerated surface are washed away with 1 per cent. chloramine-T solution.

The same treatment is said to be good also for varicose ulcers, and those due to syphilis or leishmania, specific treatment being carried out at the same time.

H. Harold Scott.

Nejrotti (Mario G.). Ulcera fagedenica tropicale e sua cura. [**The Treatment of Tropical Sloughing Phagedaena.**]—*Riforma Med.* 1927. Jan. 3. Vol. 43. No. 1. pp. 9–10.

The chief indications in the treatment of this condition are cleanliness, antisepsis and protection. The author finds Calot's liquid the most

satisfactory. This consists of iodoform 10 ; sulphuric ether 30 ; olive oil 70 ; pure creosote 6 parts ; the mixture to be thoroughly shaken before use to obtain a uniform suspension of the iodoform. It is applied every other day on gauze, and covered by wool and a bandage. Tonics (iron, arsenic, etc.) and generous diet are also needed.

H. Harold Scott.

Selisky (A. B.). Zur Histologie der Creeping Disease. [**The Histology of Creeping Disease.**]—*Arch. f. Dermat. u. Syph.* 1926. Nov. 13. Vol. 152. No. 1. pp. 123–125. With 1 text fig. [1 ref.]

Report of a case of infection of the left cheek by the Gastrophilus larva occurring in a young cab driver, considered to have taken place by direct transference of the larva from the horse to the skin of the face. The histological features of the larva and tunnel are described : these were a disintegration and degeneration of the epidermal cells, increase of pigment which was present in nearly all the epidermal layers, rarefaction of the connective tissue and wide dilatation of the blood vessels of the cutis. The larva itself lay just below the horny layer displacing the remainder of the epidermis. The tunnel contained masses of badly stained cell detritus and was surrounded by perivascular and periglandular round-celled infiltration.

W. J. O.

Austmann (Kristjan J.). **Creeping Eruption. Report of First Case from Manitoba.** – *Jl. Amer. Med. Assoc.* 1926. Oct. 9. Vol. 87. No. 15. pp. 1196–1200. With 1 text fig. [47 refs.]

This is an excellent summary of the subject of " Creeping Disease " of the skin—its several causes, its lesions, its geographical distribution according to cause, and its treatment –with 47 references to original papers.

The cause in the present case was a larva of *Gastrophilus intestinalis* (of the first stage). The patient after working in the hayfields had noticed an itchy spot on the elbow, and subsequently a red streak creeping with itchings about his forearm. The author, who began to observe the case 4 weeks afterwards, notes that the rate of progress of the circuitous streak was about 1·5 cm. a day, and that there were no vesicles in its vicinity –a point which he thinks to be distinctive from the eruption caused by the nematode Gnathostoma.

For subsequent observation and treatment he bethought him of Lombard's method of clearing the living skin. He therefore, using ordinary clear machine oil, cleared the epidermis around the end of the line of creep. Then, using a binocular dissecting microscope, he saw the parasite lying, apparently between the cornified and the granular layers of the epidermis, at a distance of about 13 mm. from the end of the line. With a magnification of 150 diam. the details of structure were clearly seen. Successive observations showed the parasite to have advanced 8 mm. in the course of four hours.

With a needle and the aid of a pocket lens the parasite was removed from the clarified epidermis, without pain to the patient, and was subsequently accurately identified. The author thinks that Lombard's device may be useful in dealing with other parasitic diseases of the skin.

A. Alcock.

Fülleborn (F.). Eine seit 20 Jahren bestehende, der "Creeping Eruption" ähnliche wandernde Hautaffektion aus Ostafrika. [**A Case of Fluctuating Skin-Eruption, of the Nature of "Creeping Eruption," of Twenty Years' Duration from East Africa.**] – *Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Nov. 1. Vol. 30. No. 11. pp. 702–704. With 1 text fig.

The patient in this case gives a very clear and trustworthy account of an eruption on the forefinger of the right hand which at the time of its appearance felt very much like the effect of an insect-bite. The eruption has continued to break out, at intervals of a week to a month, at different points in the same finger, for twenty years. No parasite has been found, but the author conjectures that the cause must be a wandering parasite—probably a nematode larva.

A. A.

Dobronravov (W.). [Un cas de "Creeping Disease".] [**A Case of Creeping Disease.**] –*Russian Jl. Trop. Med.* 1926. Nos. 6–7. pp. 41–46. With 2 text figs. [7 refs.] [In Russian.]

The author describes a case of "creeping eruption" observed in Moscow, due to a single larva of the bot-fly, *Gastrophilus equi* (= *G. intestinalis*) which had burrowed into the upper part of the left foot. It is estimated that 2½ months elapsed from the time of infection to the full development of the larva. The first symptoms were the appearance of a red spot on the skin, which caused considerable itching. The larva commenced burrowing a week later and progressed at the rate of 2 cm. a day, until, on the tenth day, its burrow reached a length of 12 cm., when it was extracted. The burrow appeared as a fine, reddish, irregular line, 1 mm. wide, with the epidermis raised 2 mm. above it.

C. A. Hoare.

Delorme (M.). Transmission expérimentale de *Sarcoptes scabiei*, var. *cuniculi*, au cynocéphale (*Papio sphinx*, E. Geoff). [**Experimental Transmission of Itch Mite to the Baboon.**]—*Bull. Soc. Path. Exot.* 1926. Dec. 8. Vol. 19. No. 10. pp. 899–900. [1 ref.]

An interesting note of the transmission of the *Sarcoptes scabiei* var. *cuniculi* from a rabbit to a baboon. The infected crusts were applied under a dressing for five days to the shaved head of the monkey. The infection, so induced, remained entirely localized to the scalp and cleared up without any treatment in the course of 3 weeks. Six months later the affected areas remained depilated, owing to the monkey developing a habit, occasioned by the itching disease, of sleeping with the lower left palm in contact with the head and of adopting this attitude under the slightest excitement.

W. J. O.

Veneroni (Carlo). Il "Mossy Foot" nella Somalia Italiana. [**Mossy Foot in Italian Somaliland.**]—*Ann. di Med. Nav. e Colon.* 1926. Sept.–Oct. Year 32. Vol. 2. No. 3–4. pp. 164–166. With 1 text fig.

The author describes a condition, which he concludes to be Mossy foot, met with in Somalia. The illustration given appears to confirm

the diagnosis which, however, was made chiefly on negative grounds — long clinical course of over 5 years in some instances, the preservation of a good general state of health, a negative Wassermann reaction, negative results of examination for parasites, leishmania, spirochaetes, fungi, or *B. tuberculosis* and the inefficacy of treatment by mercury, iodides, salvarsan, or tartar emetic. [With cases so well marked one would expect the finding of the yeast-like cells described by Medlar in sections of tissue, and the fungus, *Phialophora verrucosa*, recorded by numerous writers on the subject, but no mention is made of these: in fact, as stated, examination for fungi proved negative.]

H. Harold Scott.

Vieira (João Paulo Botelho). "Dermite de Durhing" sua variedade entre nós. — (Fogo selvagem. Pemphigus tropical.) **Dermatitis of Durhing—Tropical Pemphigus.** — *Brazil-Medico.* 1926. Aug. 21. Year 40. Vol. 2. No. 8. pp. 102–104.

The author refers to two cases of this condition, denominated locally Fogo selvagem [Wild fire] reported by him in 1922, treated by chaulmoogra, which he regards as a specific for the disease. These patients have remained in perfect health. In the present paper he records three more cases and discusses the points of difference between the condition as noted in England, France, and the United States, and that found in Rio de Janeiro.

The main features of the Brazilian variety are that it is a chronic affection liable to exacerbations accompanied by fever, that it leads to cachexia and to profound disturbance of the nervous system, central and peripheral. The actual lesion is at first vesicular, later pustular; the most frequent sites of attack are the chest, fore-arms and legs, but it may involve any part of the body except the palms and soles. If occurring on the eye blindness may result. Ankylosis of the knees and of the joints of the hands are common. The disease may be accompanied by various phobias, night terrors, marked irritability, often with ravenous appetite and hyperchlorhydria. The cause is at present unknown; it may be a nutritional disease, or have some relation to leprosy. These questions the author intends to discuss in a future paper. He is of opinion that it is inoculable, and he notes that in the districts where it occurs there are large numbers of *Triatoma megista*.

H. Harold Scott.

Nicolle (Charles) & Conseil (E.). Chronique tunisienne du *Xeroderma pigmentosum*. **Xeroderma pigmentosum in Tunis.** *Arch. Inst. Pasteur de Tunis.* 1926. Dec. Vol. 15. No. 4. pp. 341–343. [4 refs.]

Two new familial cases of Xeroderma pigmentosum from two families are reported, concerning (1) a boy (now dead at age of 8 years) who had first shown evidence of the disease when aged 6 years, and (2) a girl aged 12½ years in whom the affection commenced at the age of 6 months. These bring the number of local cases recorded to the total 19.

W. J. O.

Schröpl (Ernst). Neurodermitis durch Oxyuren. Ein Beitrag zur Pathogenese der Prurigo. [**Oxyuris Prurigo.**]—*Dermat. Woch.* 1926. July 24. Vol. 83. No. 30. pp. 1083–1097. With 5 text figs. [37 refs.]

Four cases, all concerning males, are recorded of prurigo of 2–4 years' duration associated with threadworms, the skin lesions being situated mainly over the lower half of the abdomen, hips and sacral regions, buttocks and upper part of the thighs. The first sign of the affection was itching, which was followed by the appearance of the skin lesions consisting of flat-topped papules, discrete or grouped, situated chiefly about the follicles. The skin of the affected areas showed considerable pigmentation and prominent follicles. The histological appearances are described. One case of 2 years' duration showed thermohyperaesthesia, while the cases of longer duration showed a lowering of sensibility to pain and temperature. The intracutaneous injection of oxyuris extract gave a positive focal reaction in one case. Attention is drawn to the alcoholic family history of all the patients. The central spinal anatomical relations of the nucleus of the splanchnic nerve to those of the pain, temperature and vasomotor nerves are described in detail to explain the reflex action due to the impulses arising in the intestine on these sensory and vasomotor nerve systems, the impulse being one of irritation induced by the toxin of the threadworms.

W. J. O.

Cordes (Wilhelm). Künstliche Malariainfektion bei Dermatitis herpetiformis. **Malarial Inoculation in Dermatitis herpetiformis.**]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1926. Dec. Vol. 30. No. 12. pp. 713–715. With 1 text fig. [1 ref.]

The apparent beneficial effect of a measles infection on a case of dermatitis herpetiformis, in a boy aged 4 years, suggested experimental treatment by inoculation with malaria parasites. The result was negative in regard to the healing of the disease; indeed a more severe outbreak of skin lesions occurred during the period following the last bout of fever.

W. J. O.

Kato (Yutaka). Note sommaire sur les trichophyties dans les provinces de Kiushiu et dans les îles de Riukiu et sur deux espèces nouvelles de Dermatophytes: *Trichophyton coccineum* et *Bodinia spadix* n. sp.—*Japan Jl. Dermat. & Urol.* 1926. Feb. & Mar. Vol. 26. Nos. 2 & 3. In Japanese pp. 79–110. With 41 text figs. pp. 196–230. With 59 text figs.

PLAGUE.

HIRST (L. Fabian). **Researches on the Parasitology of Plague. Part I.** —*Ceylon Jl. Sci.* (Sect. D. Med. Sci.). 1926. Dec. 18. Vol. 1. Pt. 4. pp. 155–271. With 6 figs. on 1 plate, 2 charts & 2 text figs. [57 refs.]

We have here a closely reasoned argument of the exact connexions between the species, the bionomics and biting powers of fleas infesting rats and the occurrence of plague. It was in 1913 that Hirst discovered that *X. astia* was the sole infesting flea of rats of the two principal plague-free cities of the Orient, Colombo and Madras. He expressed the view that this fact sufficed to account for their freedom, on the grounds that *X. astia*, under the tropical conditions prevailing in these areas, was an inefficient vector of plague both from rat to rat and from rat to man. He considers that *X. cheopis* was only introduced into Colombo in 1914; he considers also that it has only to be introduced into any port on the Madras seaboard in sufficient quantity under circumstances favourable to its becoming established on the rats in the vicinity of granaries for plague to appear there, as it has done in Colombo.

The general conclusion is reached, as a result of detailed experimental and epidemiological research, that the spread of bubonic plague among rats throughout the world and thus to man depends primarily on the *cheopis* population of the invaded region. We have as factors in propagation of the epizootic: (1) The degree of *cheopis* infestation per rat, which is dependent primarily upon the effect of climate on *cheopis* reproduction and secondarily on the nature and contents of the premises within which the *cheopis* is reproduced; (2) the rat population, which depends primarily on food supply. It follows naturally from this, and is the author's view, that preventive measures in areas in which *X. cheopis* is not indigenous should consist (1) in disinfection of all flea-infested merchandise imported from *cheopis*-infested regions, and (2) in rat-proofing of all premises where grain is stored in bulk.

Much of the experimentation to determine the relative efficiency of *X. cheopis* and *X. astia* as vectors of plague turns on the discovery of BACOT and MARTIN (1914) that plague could be transmitted as a result of the single bite of an infected flea by regurgitation of blood from the proventriculus, so blocked with bacilli that blood could not enter the stomach. Plague is not to be considered merely as a disease affecting man and the rodent, but also as a disease of the flea vector itself. It is reasonable to suppose that *X. astia* succumbs to the disease sooner than *X. cheopis*. Hirst never found a blocked flea of the former species alive at laboratory temperatures in Colombo even during comparatively cool weather. And yet he had no difficulty in producing blocked living *cheopis* or in infecting rats by this agency. A continuous series of positive results could be produced with this species even during the hot weather. The tentative explanation is given of the low vector efficiency of *X. astia* as due to depression of vitality by heavy growth of plague in the alimentary canal. "As *astia* bites at shorter intervals than *cheopis*, blockage of the proventriculus leads to more rapid death by inanition especially under conditions of high temperature or low humidity."

But it is not maintained that *X. astia* is never a transmitter of plague. Recent work indicates that the difference in vector efficiency between *astia* and *cheopis* in a place like Colombo diminishes when the climatic conditions become more favourable to the viability of both. A good measure of the effect of climate is the egg-laying ratio of the plague flea, although longevity of the unfed flea may be the more sensitive index of effect of humidity. And this brings the author to the consideration of the possibility of a forecast of probable plague incidence. An estimate made even a few weeks in advance would be extremely valuable and this, it is maintained, may be based upon the measure proposed above.

Part I of this important memoir concludes with a chapter on the species of fleas parasitic upon rats.

W. F. Harvey.

Pirie (J. H. Harvey) & Murray (W. A.). **Plague in the North-West of the Cape Province.**— *Jl. Med. Assoc. S. Africa.* 1927. Feb. 12. Vol. 1. No. 3. pp. 50–59. With 1 map & 3 graphs. [5 refs.]

This is a paper read at the S.A. Congress in 1926. It deals with the general aspects and contains little that is new. Dr. Ingram provided the entomological notes :—

On the Namaqua gerbille the only flea found is *Xenopsylla eridos*, and the larvae breed in the dry sand of the burrows. The fleas found on the Karroo rats are, in order of frequency, *Chiastopsylla mulleri* sp. nov. (80 per cent.) ; *Listropsylla agrippinae* ; *Ch. rossi* ; *X. eridos* and *Hypsophthalmus aganipes*. It is likely that *X. eridos* is the principal carrier of plague in the district on account of the variety of its rodent hosts. It has been found experimentally to be a carrier from rodent to rodent and bites man. On hares only *Ctenocephalus canis* and *X. eridos* are found. [*ante*, p. 37 (Ingram and Pirie)].

J. H. Tull Walsh.

Raynal. Rapport sur l'épidémie de peste de Diégo-Suarez en 1924. [**Epidemic of Plague at Diégo-Suarez, 1924.**]—*Ann. de Méd. et de Pharm. Colon.* 1926. Oct.–Nov.–Dec. Vol. 24. No. 4. pp. 467–512. [2 refs.]

The plague infection was apparently introduced into the Ville-Basse quarter of Diégo-Suarez (Madagascar) from some ship in the port and from there a rodent epizootic carried the disease to the quarter of the Octroi and to Tanambao. The cases were mostly of the bubonic type—54 cases with 48 deaths. But in addition 10 cases of septicaemic plague and 5 cases of primary pulmonary plague were recorded ; all fatal. The hospital mortality was 79 per cent. in spite of rapid treatment with anti-plague serum given intravenously in doses of 100 to 200 cc. daily. The epidemic appeared in the dry season and ceased before the first rains. The cases were almost confined to natives working in the depots or in the shops along the quays. The diagnosis was confirmed in the laboratory in human cases and in rodents.

J. H. T. W.

Tournier (E.). Sur la gravité de la peste pulmonaire à Madagascar. [**The Gravity of Pneumonic Plague in Madagascar.**] —*Bull. Soc. Path. Exot.* 1926. Oct. 13. Vol. 19. No. 8. pp. 667–670. [3 refs.]

The author compares the virulence of pulmonary plague and the number of cases in Madagascar with those reported by M. Marcel Leger from Senegal (*Bull. Soc. Path. Exot.* 1926. June. p. 415) :—

	Cases.	*Deaths*
Madagascar	917	860
Senegal	140	75

In Madagascar these cases develop in four or five days, often more rapidly, and nearly all are fatal. At Tamatave, where anti-plague vaccination is considerable and repeated, the disease seems to be less serious than on the High-Plateau, where vaccinations are few. Thus anti-plague vaccination appears to be the best weapon for checking extension of the disease. Treatment, in addition to intravenous injections of anti-plague serum, which has not given much success, was purely symptomatic and general.

J. H. T. W.

Sicé (A.). Considérations sur l'évolution de la peste dans la province de Fort Dauphin (Madagascar Méridional) de 1924–1926. [**Plague in Southern Madagascar, 1924-6.**] —*Bull. Soc. Path. Exot.* 1927. Feb. 9. Vol. 20. No. 2. pp. 106–113. With 8 text figs.

From the end of 1924 to 1926, thirty-seven cases were actually recorded. The disease appeared in the septicaemic and bubonic forms. Of 19 cases that received early treatment only 5 died ; while 18 cases not receiving treatment all died Several of the cases are described in detail. Subcutaneous injections of serum were followed by recovery. To economize serum, which was difficult to obtain, auto-haemotherapy was employed. Blood drawn from veins at the elbow was injected in 20 cc. doses under the skin of the abdomen with good results and without local or general reactions.

J. H. T. W.

Zabolotny (D.) & Oméliansky (W.). [Edited by.] La peste endémique au Sud-Est de U.S.S.R. [**Endemic Plague in South East Russia.**] — pp. xiii + 111. With numerous illustrations. 1926. Leningrad : Édition de l'Institut de Médecine Expérimentale.

This essay deals in great detail with plague in general and with outbreaks among human beings and rodents in South East Russia. It is a useful compilation, but contains nothing new. Much of the information has appeared in previous papers by Zabolotny, Wu Lien Teh, Nikanorow, etc.—see index of vols. of *Bulletin*.

J. H. T. W.

Naidu (B. P. B.) & Shamsher Jang. **The Treatment of Plague with Mercurochrome-220 Soluble.** *Indian Jl. Med. Res.* 1926. Oct. Vol. 14. No. 2. pp. 323–328. [13 refs.]

As the result of experiments on animals the authors report :—

1. Mercurochrome-220 soluble is lethal to plague bacilli in a dilution of 1 in 3,200 after contact for 15 minutes.

2 & 3. When injected hypodermically it was not lethal to rats in doses of 10 milligrammes; nor was it lethal for rabbits in similar doses per kilo of weight, when injected intravenously.

4. In the treatment of plague doses, whether single or repeated, totalling in all from 5·0 mgm. to 73·5 mgm. have no influence on the duration or termination of plague in rabbits and rats [v. this *Bulletin*, Vol. 22, p. 378 (BALFOUR)].

J. H. T. W.

WU LIEN-TEH. **Practical Aspects of Plague in Wild Rodents.**—*Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress, Tokyo, 1925.* Vol. 2. pp. 815–836. [34 refs.]

Much of the information conveyed in this paper has appeared in previous papers by the same author [v. Index to previous vols. of this *Bulletin*]. The Summary is to the following effect: The ectoparasites of wild rodents play a principal part in the transmission of plague from animal to animal and from animal to man. Complete evidence is furnished in the case of the Californian ground squirrel and Siberian marmot.

Extermination of wild rodents suffering from plague is a difficult process and where permanent results cannot be attained concentration upon indirect methods must be considered.

The tarabagan being a great economical asset, lies in a class of its own. Consequently a special plague policy should be adopted in districts inhabited by this rodent.

J. H. T. W.

i. MARRAS (F. M.). **The Value of the Thermoprecipitin Reaction in the Diagnosis of Rats putrefied and died of Plague.**—*Indian Jl. Med. Res.* 1926. Oct. Vol. 14. No. 2. pp. 281–285. With 1 plate. [6 refs.]

ii. ——. **A Rapid Method for the Diagnosis of Plague.**—*Ibid.* pp. 287–290. With 3 plates (2 coloured). [3 refs.]

i. In rats that have recently died of plague we can easily observe the characteristic lesions of plague. The temperature of Bombay favours rapid putrefaction; hence the impossibility of the culture method and the inconstant results of inoculation. The thermoprecipitin reaction is not constant for rats dead of plague and putrefied. The positive results have an absolute value, because the result is nearly always confirmed by inoculation on animals.

ii. The author found that the plague bacillus ferments glucose and laevulose solutions more rapidly than mannite. Lactose, saccharose and dulcite are not changed by the plague bacillus (Plate XI). The medium used was:—

1,000 cc. distilled water.
10 gm. peptone (free of sugar).
5 gm. sodium chloride.
15 cc. of 10 per cent. solution of carbonate of soda.

The sugar solution (coloured blue with litmus) is added. Fermentation usually begins after 20 hours in glucose and nearly at the same time for laevulose; in mannite between 24 and 48 hours. The colour of the liquid medium changes little by little into a vivid red owing to the production of acid which reacts with the litmus. To accelerate the

multiplication of germs and the sugar fermentation a small quantity of immune rabbit serum is added. The reaction may then occur within 5 to 7 hours and signs of agglutination of the bacilli can be seen under the microscope (Plate XIII). In the experiments the tubes were inoculated with bacilli from a broth culture. They could be inoculated from a patient.

J. H. T. W.

Williams (C. L.). **Experimentally Produced Late Bacteremia and Resolving Plague in Rats.** *Amer. Jl. Trop. Med.* 1926. Sept. Vol. 6. No. 5. pp. 367–375. [4 refs.]

The results of the author's experiments were: 5·1 per cent. of 310 plague infected rats recovered from the infection and were found to have lesions of resolving plague when killed 21 days after inoculation. 6·8 per cent. of 890 had lesions 30 days after inoculation and 2 of 39 after 46 days. Nine killed 21 days, eleven after 30 days and one after 46 days after infection had plague bacilli in their tissues as demonstrated by positive results of guineapig inoculations. The occurrence of plague "carriers" among rats appear probable. [That the continuance of plague is mainly due to such "carriers" among rodents is not a new theory and is we think fairly obvious—see this *Bulletin* index to previous Vols.; also Williams *ante*, p. 34.]

J. H. T. W.

v. Prelsz (H.). Zwei eigenartige Varianten des Pestbazillus. [**Two Variants of the Plague Bacillus.** —*Cent. f. Bakt.* I. Abt. Orig. 1926. Dec. 7. Vol. 101. No. 1-3. pp. 65–77. With 1 plate. [3 refs.]

Bacilli which pass through hundreds of generations in an extremely short period of time, as compared with higher forms of life, offer an excellent field for the observation of variation. Two variants are described in this study. One possessed the property of forming a smoke-grey to black pigment. This pigmentation appeared only in old cultures and especially in secondary offshoots of the original. Subculture from these pigmented offshoots gave rise only to unpigmented colonies which might later develop pigmentation.

The second variant appeared as colonies of liquid or slimy consistence, which might live only for 2 or 3 days. The bacilli of this type of colony are enormously swollen and finally burst, when the colony shrinks to a dim imperceptible disc. The phenomenon suggests disease of the organism or bacteriophagy, for these colonies give rise on subculture to similar colonies. But it has not been possible to transmit the disease to normal strains of the *B. pestis* or to other organisms, nor are the colony appearances of bacteriophagy demonstrable.

W. F. Harvey.

Naidu (B. P. B.) & Shamsher Jang. **The Toxicity and the Immunising Value of Sensitised Anti-Plague Vaccines.** *Indian. Jl. Med. Res.* 1926. Oct. Vol. 14. No. 2. pp. 319–321. [6 refs.]

Agar cultures of *B. pestis* were sensitized with rabbit, sheep and horse immune sera respectively and these vaccines were compared with an unsensitized serum-agar vaccine and with Haffkine's prophylactic

vaccine. An immunizing dose of 0·5 cc. was injected subcutaneously into rats, and 7 days later the animals were subjected to a testing dose of 0·003 mgm. of spleen of a rat that had just died of acute plague. Some of the animals succumbed to the immunizing vaccine. The numbers left for test of the three sensitized vaccines were 57, 43, and 68 respectively and for the unsensitized agar vaccine and Haffkine prophylactic 55 and 46. Fifty untreated animals furnished the control. Percentage mortalities for the five vaccines and for the control were 61·4, 51·1, 44·1, 61·8, 50·0, and 14·0 in serial order. They show that, under the conditions of the experimentation, the sensitized vaccines showed no advantage over the unsensitized.

W. F. H.

Burnet (Et.). Recherches sur les formes filtrantes des bactéries. Expériences sur la bactérie de la peste. [**Filtrable Forms of Bacteria. Experiments with the Plague Bacillus.**—*Arch. Inst. Pasteur de Tunis.* 1926. Dec. Vol. 15. No. 4. pp. 292–304.

Schaudinn in 1904 postulated the existence of invisible filtrable stages in the life cycle of various haematozoa and spirochaetes. This idea of connexion between the visible stage of development of an organism and an invisible or granular filtrable stage has been gaining adherents. The examples which may be adduced in support of it are : The visible colonies and forms derived from the filtrate of peripneumonia bovine virus ; the filtration of *B. suipestifer* ; the existence of filtrable forms of *B. tuberculosis* ; the existence of an invisible filtrable virulent stage of the spirochaete of relapsing fever ; the hypothesis that *Proteus* X19 is the macroscopic form of the invisible typhus fever virus ; the observation in filtrates of bouillon cultures of B. Shiga and *B. typhosus*, lysed by bacteriophage, of granules capable of reconstructing the normal form ; the observation of the virulence of the filtrate of the condensation fluid of cultures of *T. lewisi* ; the virulence of filtrates of organs infected by *T. brucei* ; the possibility that the filtrable virus of scarlet fever may be derived from *Str. scarlatinae*, that filtrable poliomyelitis virus may be derived from a polymorphic micrococcus, that filtrable influenza virus may be derived from *B. influenzae* or *B. pneumosintes* ; the observation that infraparticles set free from Rous sarcoma cells are possessed of neoplastic characters. It was Heidenhain who conceived the idea that every cell was resolvable into elementary infracorpuscles, capable of regenerating the cells—" *Omnis cellula e granulo.*"

This constitutes the introduction of the author and gives the basis of his experimentation. His essays to obtain infracorpuscles from variously treated cultures of *V. cholerae, B. proteus, B. subtilis, B. pestis*, and *B. diphtheriae* all failed. There remained the test of virulence for the supposed " inframicrobe " and he chose *B. pestis* as the most suitable organism for the purpose because of its pathogenicity for laboratory animals. Experiments on mice, which were utilized at various stages of plague infection, yielded one positive result. In this positive case all the organs of 2 mice were ground up to give a suspension, which was kept to autolyse for 5 hours at 35° C. and for 24 hours at room temperature. The inoculation of the filtrate of the suspension through an L1 Chamberland candle was negative in mice, but the simple filtrate itself developed on the third day a culture of *B. pestis*. A second set of experiments was made with the autolysed organs of plague guineapigs and here two positive results were forthcoming. The first was given by the filtrate of the suspension of the

organs of a guineapig inoculated with human plague bubo. No infection of guineapigs was obtained with the filtrate, but two tubes to which fresh bouillon had been added gave true cultures. The second was given by the filtrate of purulent exudate from a guineapig previously immunized to plague and inoculated intraperitoneally. The L1 filtrate gave no culture on this occasion but killed a guineapig with plague in dose of 2 cc. on the ninth day. A third set of experiments with plague fleas proved entirely negative.

The positive results would indicate that the filtrable forms are to be found particularly in infected tissues and not in laboratory cultures. The tissues, moreover, were themselves already suppurating and autolysing, as well as the bacteria which they contained. It is concluded that the filtrable forms of *B. pestis* are particles or granules derived from the lytic disintegration of the bacteria. In any case, it may be concluded that filtrable forms of *B. pestis* do exist.

W. F. H.

Leger (Marcel). La peste au Sénégal de 1914 à 1924. *Ann. de Méd. et de Pharm. Colon.* 1926. July–Aug.–Sept. Vol. 24. No. 3. pp. 273–318. [43 refs.]

CHOLERA.

Tomb (J. Walker) & Maitra (G. C.). **On "Agglutinating" and "Non-Agglutinating" Vibrios found in the Human Intestine and in Water, and the Relationship between them.**—*Indian Med. Gaz.* 1926. Nov. Vol. 61. No. 11. pp. 537–540. [2 refs.]

Ground tanks had previously been found heavily infested with non-agglutinating vibrios, especially during the epidemic season of cholera. That these vibrios were derived from human carriers is shown by the effect of closure of tanks to washing after defaecation, when the vibrios disappeared in 10 to 12 days only to reappear in 24 hours after re-opening. At least 30 per cent. of the inhabitants using the tanks were, by a peptone enrichment method of cultivation in open bowls, shown to be permanent carriers of non-agglutinating vibrios. What then is the relationship of these non-agglutinating vibrios to agglutinating cholera vibrios, from which they differ in no way but this character, as judged by the laboratory tests employed? In several small and localized epidemics of cholera the tanks of the infected villages immediately became heavily infested with non-agglutinating vibrios, which disappeared with the subsidence of the epidemic. The stools of cases of recovery from cholera were examined and showed disappearance of all vibrios after 2 to 3 weeks in 70 per cent. and persistence of non-agglutinating only in 30 per cent. Non-agglutinating vibrios, moreover, are found in very constant association with sporadic, as distinct from epidemic cholera. As test of transformation of agglutinating vibrios into non-agglutinating, the author selected tanks free from vibrios, inseminated them with fresh cholera stools containing large numbers of agglutinating vibrios and examined the water 2-hourly thereafter. In every instance the water showed between the 12th and 20th hour none but non-agglutinating vibrios.

They make the striking deductions that:—

1. The agglutinating vibrio found in cholera dejecta and the non-agglutinating vibrio found in carriers and in water contaminated with human faeces are one and the same organism.

2. The non-agglutinating vibrio is the permanent form in nature and constitutes the reservoir of endemic cholera.

3. The non-agglutinating form of vibrio is changed into the agglutinating form under favourable conditions in the human intestine.

W. F. Harvey.

Tomb (J. W.) & Maitra (G. C.). **A New Conception of the Epidemiology and Endemiology of Cholera.**—*Indian Med. Gaz.* 1927. Feb. Vol. 62. No. 2. pp. 61–64. [7 refs.]

The argument is that investigations have revealed that sporadic cholera is very constantly associated with non-agglutinating vibrios which differ from the vibrio of Koch in agglutinability alone. Extended research has proved that no carriers of agglutinating vibrios could be demonstrated. Outbreaks of epidemic cholera have been observed where no history of immediate infection from an outside source could be obtained. The authors noted that during the hot weather (March to June) vibrios were numerous in the ponds and tanks in the Asansol

Mining Settlement used for washing after defaecation. On such washing being forbidden it was found that the vibrios gradually diminished and always disappeared after 12 to 14 days. When they attempted to isolate vibrios from the stools of people who had visited the tanks the results were completely negative. Thinking that the ordinary peptone enrichment process was unsatisfactory for isolating vibrios from solid stools, the authors used the "open-bowl" method (*Indian Med. Gaz.* Feb. and Nov. 1926). For the examination of stools from cholera cases a different method is used. By means of the open-bowl method it was shown that in endemic areas of the Mining Settlement as many as 35 per cent. of the inhabitants were chronic carriers of non-agglutinating vibrios. A non-agglutinating vibrio injected into a rabbit caused death and from the gall-bladder the authors recovered a partially agglutinating vibrio. Efforts to convert non-agglutinating vibrios into the agglutinating type were inconstant and inconclusive. Agglutinating vibrios from fresh cholera stools were sown in a tank free from vibrios and all changed into the non-agglutinating type after 12 to 14 hours.

"We have therefore been driven to the unavoidable conclusion that the non-agglutinating vibrio . . . takes on the agglutinating characteristic under certain bio-chemico-physical conditions in the human intestine the nature of which are at present unknown, and in this mutation or epidemic form is the cause of epidemic cholera, since it is not unreasonable to assume that a characteristic so unstable may as easily be acquired as lost.

"Non-agglutinating intestinal vibrios therefore in our opinion constitute the reservoir of cholera both epidemic and endemic."

"When once therefore cholera has been introduced into a community in widespread epidemic form, great numbers of chronic carriers of non-agglutinating vibrios remain—apparently for years."

"We have been unable to ascertain by experiment whether or not the agglutinating vibrio immediately after it has lost agglutinability is still capable of conveying epidemic cholera, but from our combined observations in the field and laboratory we conclude that the vibrio is capable of conveying cholera for some time after agglutinability has been lost."

J. H. Tull Walsh.

Bercovitz (Nathaniel). **The 1926 Hoihow Cholera Epidemic.** *China Med. Jl.* 1926. Dec. Vol. 40. No. 12. pp. 1237–1240.

The author's conclusions are of some interest as distinctly referring to medical work in China. An interesting account is given of how the town was cleaned and the sale of food in the streets forbidden :—

1. Sanitary measures will prevent epidemics of cholera.
2. General admission of cholera patients into general hospitals is impracticable because the other patients will all leave.
3. The most valuable remedy was warm, slightly hypertonic saline solution; "with regard to the cases that died the only thing we might have done better as far as we know would have been more intensive treatment with intravenous saline."

J. H. T. W.

Skinner (A. H.). **A Note on Cholera Sicca.** *China Med. Jl.* 1926. Sept. Vol. 40. No. 9. pp. 850–851.

The author believes that text-books do not emphasize how easily this type of cholera may be overlooked: (1) When cases are few; and (2) when the patient is unknown to the physician, i.e., when he

cannot easily judge of the change in the patient's appearance: shrinking of face, fingers and feet, pulse feeble; voice feeble and husky; suppression of urine and bladder empty (catheter). Treatment: Intravenous saline injections until urination takes place.

J. H. T. W.

GAVINO (C.). **Cholera Cases admitted in San Lazaro Hospital from September 1 to November 30, 1925.** – *Jl. Philippine Islands Med. Assoc.* 1927. Jan. Vol. 7. No. 1. pp. 3–7.

The author deals with 284 cases admitted into the San Lazaro Hospital between September 1st and November 30th, 1925. Of these cases 189 were residents in the city of Manila and 95 were from the provinces; 76 of the total number died. The 1925 outbreak was characterized by the greater number of cases with profound toxaemia as compared with those of the epidemic in 1918–1919.

J. H. T. W.

LIEU (K. W. John). **Treatment of Cholera. A Study of the Routine Treatment of 1,281 Cases from the Chinese Infectious Diseases Hospital, Shanghai.** – *Nat. Med. Jl. China.* 1926. Dec. Vol. 12. No. 6. pp. 473–485.

The author rightly believes that "the careful observation and stewardship of any large number of cases imply a certain responsibility to one's fellow workers" and he gives a brief report of 1,281 cases of cholera treated in the Chinese Infectious Hospital, Shanghai, during 1925. For transfusion normal saline solution was employed. The mortality was only 28 per cent. and saline was given without delay to all cases in the algid stage. Of the 1,281 cases 519 recovered, 423 were improved, 31 unimproved, 141 died and 168 were discharged against advice. For general treatment in addition to transfusion (if indicated) were used: camphorated brandy, Kaolin as a free drink, sodium bicarbonate gr. xxx with pot. citrate gr. xv three times a day, and 2 per cent. sodium chloride solution when nausea and vomiting were present. Atropine was useful for dyspnoea. For acidosis sodium bicarbonate was given as routine treatment ½–1 drachm four times a day. The "essential oils" mixture proved useful; one must not be discouraged if the first one or two doses provoke vomiting; the result is good, in early cases, after six doses. Ten cases—the details of which are given—were treated with mercurochrome-220, either before collapse or after transfusion. Clinical observations which were carefully made seemed to indicate that intravenous injection of this drug in no way interfered with the progress of the infection. Anti-cholera vaccine was used as a means of personal prophylaxis.

J. H. T. W.

i. BHARATI (S. Rajaram). **Observations on the Treatment of Cholera with Essential Oils, Mistura Pro-Diarrhoea and Permanganate of Potash.**—*Indian Med. Gaz.* 1926. Dec. Vol. 61. No. 12. pp. 596–597.

ii. CANNON (Alexander). **The Essential Oil Treatment of Cholera.**—*Brit. Med. Jl.* 1927. Jan. 15. p. 98.

i. The author finds that the "essential oils mixture" is of value as early treatment in cholera. Cases treated with essential oils before

the onset of the algid stage seldom go on to the stage requiring intravenous saline injections. He finds that potassium permanganate pills are often passed unchanged in the stools. Eighteen cases were treated, six of which passed into the algid stage and received saline injections; 83 per cent. recoveries.

ii. Dr. Cannon also recommends the essential oils mixture (Tomb's formula) and gives details of eight cases. His bacteriological examinations showed that, following the administration of Dr. Tomb's mixture, the vibrio ceases to exist in the stools after a period of six to twelve hours [see this *Bulletin*, Vol. 20, p. 737 (Tomb)].

J. H. T. W.

Takano (Rokuro), Ohtsubo (Itsuya) & Inouye (Zenjuro). **Studies of Cholera in Japan.**—League of Nations. Health Organisation. C.H. 515.—121 pp. 1926. Dec. Geneva.

These studies, extending over a number of important and controversial subjects, form a comprehensive and critical survey of research on cholera. Only a few points can be extracted, from what is to all intents and purposes a monograph on cholera.

I. *Culture Media.* Although a highly alkaline medium is considered to be the best for the isolation of *V. cholerae*, Ohno (1912) found that all strains did not grow equally well in it and recommended the use of peptone water of different degrees of alkalinity. Matsuo (1924) gives the range of growth as from pH 4·5 to 11·3, while that of *B. coli* is from 3 to 10·8. The cholera vibrio thrives well at pH 9–10 and at this point *B. coli* is greatly inhibited.

II. *Examination of the Cholera Vibrio.* Vibrios are agglutinated by the normal serum of the horse, ox, sheep, dog, rabbit, guineapig and man in this order of strength, and of these animals the rabbit, on immunization, furnishes the best diagnostic serum. If immunizing injections are too frequently repeated the agglutinin titre is increased but specificity is diminished; that is to say group agglutinins for non-pathogenic vibrios make their appearance. Kabeshima (1922) considers that both typical and atypical cholera vibrios are capable of causing epidemics.

III. *Types and Variations of Cholera Vibrios.* Fukushima (1913) injected the cholera vibrio into the gall bladder of a rabbit and allowed it to remain there. He obtained at the end of 105 days a vibrio growing at the bottom of the peptone water tube, having little motility, giving colonies which were hard and did not suspend homogeneously, of low virulence and incompletely agglutinable. On the other hand, Toyoshima (1918) cultivated a non-pathogenic vibrio in cholera-immune serum, in a filtrate of cholera culture, and in symbiosis with *V. cholerae*, by which means he converted a non-agglutinable vibrio into an agglutinable one. Kabeshima (1913) recognized the existence of two types of cholera vibrio and separated them, according to their agglutination reactions, into typical and atypical. The atypical vibrio was capable of being changed in various ways into the typical and *vice versa*. Watanabe, Kawai and Watanabe accepted Kabeshima's views, but classified their cholera vibrios into three types. Nobechi (1921, 1922) found a cholera vibrio intermediate in type between the typical and atypical.

IV. *Cholera-like Vibrios.* Agglutination tests are not, according to Amaya (1920), absolute, and therefore animal tests may have to be carried out.

V. *Agglutination Reactions.* Thermostable and thermolabile receptors of cholera vibrios are described, with immune serum containing agglutinins for each receptor. This is true for all types of cholera vibrio, but the relative proportions of the receptors may vary. It has often been shown that the agglutinability of the cholera vibrio cultured on a medium containing

cholera immune serum is diminished. Miyake & Inouye (1921) both produced evidence for the existence of two agglutinogens in cholera. It would appear generally that the agglutinability of *V. cholerae* is easily altered. In practice it is recognized that there are some organisms other than cholera which are agglutinated by cholera serum.

VI. *Cholera Vaccines.* The two types of vaccine favoured in Japan have been a heat-killed suspensiou of vibrios and a sensitized vaccine. Much research has been undertaken into the respective values of these. As to the preventive effect of vaccine in practice, it is admitted that it is difficult to compare the infection rate in the vaccinated and unvaccinated. Nor do there appear to be sufficient data for the estimation of degree of protection conferred. The strain of organism which furnishes antigen is all important, but according to Koyama (1924) no biological characteristic indicates the antigenic power of any given strain.

VII. *Biological Characteristics.* Research upon the cholera toxin has occupied workers in Japan as elsewhere. Takano (1918) came to the conclusion that it was difficult to distinguish between the exotoxin and endotoxin. This subject merges with that of the haemotoxin of true cholera vibrios. Kabeshima (1913) concluded that there are haemotoxic and non-haemotoxic cholera vibrios, but haemolytic action is not a fixed but an easily variable characteristic of the cholera vibrio. Toshima (1919) found that when a non-haemolytic strain of cholera is grown in symbiosis with a haemolytic non-pathogenic vibrio, the former acquires haemolytic properties. "Many non-pathogenic vibrios," he argues, "have no haemolytic action, so haemolytic activity is not an important point of differentiation between pathogenic and non-pathogenic vibrios."

VIII. *The Fate of the Cholera Vibrio Outside the Body.* The viability of the cholera vibrio in sea water and other waters, on the surface and in the intestine of fish and oysters, and on vegetables has been studied and also in this connexion the disinfection of food.

IX. *Clinical Studies.* Among carriers the majority (52 out of 112) were found by Sakai (1916) to be excreting only on the day of their discovery. He gives a frequency distribution of the number of days of carriage which shows clearly how small are the numbers excreting after the 8th day, although there were cases still showing on the 19th, 20th, and 21st days. He states that the highest titre of the serum of 84 carriers examined by him (1917) was 2,000 and that over one-third had a titre over 200. Moreover, the highest titre was only reached in many cases on the 4th, 5th, 8th, and 9th days after their determination as carriers. Oshima (1922) reported on the examination of cholera patients.—If the rate of excretion of the vibrio during the first week be set down at 100 per cent., the rates in the 5 subsequent weeks were 45·6, 25, 16·2, 7·3 and 1·6 respectively. The longest period of excretion noted by him was 40 days.

Serum therapy in cholera has not been over-successful. Murayama found that in mild cases the intravenous or subcutaneous injection of glucose (3 per cent. in 0·3 per cent. or 0·85 per cent. salt) had good effect.

X. *Cholera Epidemics in Japan.* The history and epidemiology are considered and many useful tables are given.

W. F. H.

Tohyama (Yuzo). **Experimental Investigations concerning the Prevention of Epidemic Diseases due to Aquatic Products. (First Report.)** [**Cholera.**]—*Scientific Reports Govt. Inst. Infect. Dis.* Tokyo. 1925. Vol. 4. pp. 169–222. With 11 charts. [44 refs.]

This is a paper of detailed laboratory experiments on the vitality of the cholera vibrio on and in the bodies of fish, oysters and clams. Investigations were also made into the resisting power of *V. cholerae* to temperature, humidity and disinfectants. *V. cholerae* and *V. Metschnikoffi*, maintained in the Institute, were used in these

experiments. The author points out that the Japanese are the greatest eaters of fish in the world, especially raw fish; thus any connexion between this kind of food and epidemic diseases is important.

V. cholerae when applied to the body of fish or to strips of fish will die in boiling water in 1 to 2 minutes; longer if the fish is very large. Concerning the period of survival of *V. cholerae* placed on fish it is recorded that fish of 22 kinds, comprising bonito, mackerel, tunny, sardines, etc. (with cuttle-fish included), were dipped in liquid containing 20·0 mgm. of active *V. cholerae* in 1·0 litre of physiological salt solution. These fish were kept, some at room temperature (summer) and some in the refrigerator, and examined daily. Fish left in the room produced a bad smell in about 36 hours; those in the refrigerator began to degenerate in a week. The tables show that at room temperature the vibrio survived:— on fresh fish or sterilized for from 5 to 10 days; on fish in the refrigerating room from 14 to 25 days. On prawns, shrimps and cuttle-fish, under the same conditions, the survival period was shorter. There is no relation between the kind of fish and the period of survival. With regard to the penetration of *V. cholerae* into the deeper flesh of fish it was shown that penetration through fresh and healthy epidermis is impossible; if the fish is injured, soft or decayed, penetration occurs. Another point examined was the sterilizing power of salt as used in curing fish. The purer the salt the greater the sterilizing power; but even in the refrigerating room the vibrio lived 15 days in 1 per cent. and 5 per cent. solutions; for 3 days in 10 per cent. and for 24 hours in the saturated solution, 30 per cent.

Experimental studies were made on the intrusion of *V. cholerae* into the oyster. Oysters in the shell or otherwise, dipped in fresh or salt water infected with *V. cholerae*, will take the vibrio into stomach and intestines even in one minute irrespective of their, the oysters', life or death. The duration of life of the vibrio in the oyster and clam ranged roughly from 4 to 40 days under experimental conditions. The effect of acetic acid applied to infected oysters was to cause the death of vibrios on the surface in 2 hours by a 1 per cent. acid solution; those in the stomach require about 4 per cent. for their destruction.

J. H. T. W.

Inouye (Zenjuro) & Kakihara (Tatsuo). **On the Types of the Strains in the Cholera Epidemic in 1925 in Japan and the Classification of *Vibrio cholerae*.—*Scientific Reports Govt. Inst. Infect. Dis.* Tokyo. 1925. Vol. 4. pp. 17–27. [17 refs.]**

The organisms isolated in this epidemic along with others were investigated morphologically, culturally, biochemically, for virulence, and serologically. It is interesting to note that the haemolytic properties were tested with erythrocytes of different species of animals, and that whereas horse and guineapig erythrocytes were definitely haemolysed, those of ox, rabbit and sheep were either weakly or not at all haemolysed. The research had mainly to do with separation of the *V. cholerae* into types after the pattern of the pneumococcus. The types arrived at are three, of which Nos. 1 & 2 are the extremes and No. 3 represents, as does No. 4 for the pneumococcus, those organisms which do not belong to one of the extreme serological types. Thus the authors recommend the adoption for cholera of types 1, 2, and 3.

W. F. H.

Hachitani (Tsunetaro), Takita (Jungo) & Shoetensack (Mark). [**Studies on the Strain of Cholera Vibrio cultivated from Cases occurring in 1925 Epidemic, and on the Varieties of Cholera Vibrios found Non-Cultivated.**]—*Saikingaku Zasshi* (*Jl. of Bact.*). 1926. Dec. No. 358. Summarized in *Japan Med. World.* 1926. July 15. Vol. 6. No. 7. pp. 191–192.]

A comparison is instituted between 1,025 strains of cholera isolated in the Japanese epidemic of 1925 with strains obtained in other epidemics. Four types were separated. The basis of typing was the agglutination by the serum of rabbits immunized with the various strains available. As a result the following were differentiated: (1) a 1925 strain; (2) a 1911 strain; (3) a Shanghai strain; (4)an El Tor strain. The agglutinating serum of the El Tor group reacted to titre with the Shanghai group, but not *vice versa*.

W. F. H.

Yasuhara (Setsutaro). **How long does Cholera Vibrio live in the Water in Winter?** – *Jl. Public Health Assoc. Japan.* 1926. Sept. Vol. 2. No. 9. pp. 1–3.

From November 1925 to January 1926 cholera prevailed in the Wakayama prefecture, the centre of the epidemic being a port called Katsuura. As the result of the author's experiments on the life of the cholera vibrio in winter we find that *V. cholerae* survived :—

11 days in sea water.
13 days in water at the river mouth.
8 days in river water.
8 days in waterworks water.
6 days in well water.

[*v.* this *Bulletin*, Vol. 22, p. 391 (Ohwada); Vol. 18, p. 357 (Flu); also index to previous vols.].

J. H. T. W.

Ray (Jyotis Chandra). Versuche ueber die septicämischen und enterotropen Eigenschaften der Choleravibrionen. [**Septicaemic and Enterotropic Characters of the Cholera Vibrio.**]—*Ztschr. f. Hyg. u. Infektionskr.* 1927. Jan. 27. Vol. 107. No. 1. pp. 46–55. [16 refs.]

Laboratory (Hyg. Inst. Berlin) cultures and cultures received from Paris and Calcutta were used in doses ranging from 1-6th up to a whole agar slope. Parenteral introduction, whether subcutaneous, intravenous, intraperitoneal or intracardiac could, with large doses, and more particularly with freshly isolated strains, produce a septicaemia and appearance of *V. cholerae* in small intestine, large intestine, liver, and gall bladder. This appearance of the vibrios in the intestine may be due to passage into the gut with the bile or to passage through the intestinal wall from the capillary blood vessels; it is closely related to the occurrence of bacteriaemia. But the favouring action of bile, quite apart from passage into the intestine with the bile, is undoubted. Whether the bile provides satisfactory conditions for life in the intestine or favours the passage through the intestinal wall in the way that in oral administration it favours passage of antigen in the reverse direction or whether some other explanation is to be sought for

their presence, is not yet evident. With the production of a septicaemia and the proof of its pathogenicity to pigeons the special characters which distinguish *V. cholerae* from *V. metchnikowi* disappear.

W. F. H.

Landsteiner (K.) & Levine (Philip). **On a Specific Substance of the Cholera Vibrio.**—*Proc. Soc. Experim. Biol. & Med.* 1926. Vol. 24. No. 3. pp. 248–249. [2 refs.]

This investigation was concerned with the procural of an alcohol-soluble specific substance. No such substance could be detected in extracts made with ether or hot absolute alcohol; they were present in hot 75 per cent. alcoholic extracts of the bacilli, previously washed with saline and extracted with ether and hot absolute alcohol. A sediment separated from this solution on cooling, which reacted with anticholera serum up to 1–500,000 dilution of the antigen, gave protein reactions, and acted as antigen on injection.

With further purification, specific substance was obtained as a white water-soluble powder containing carbohydrates, which failed to give any biuret reaction and had slight if any antigenic activity. None the less it reacted with immune sera in a dilution of 1–500,000.

The original antigenic activity could be explained if the alcohol extract contained a complex antigen of protein and the specifically reacting but non-antigenic substance.

W. F. H.

Eisler (M.) & Kovács (N.). Untersuchungen ueber das Verhältnis des Präzipitinogens und Hämotoxins des Vibrio Kadiköj und das Unvermögen dieses Toxins, sein spezifisches Antitoxin zu flocken. [**Relationship of Precipitinogen and Haemotoxin of *V. kadiköj*. Inability of this Toxin to give Flocculation with its Antitoxin.**] —*Cent. f. Bakt.* I. Abt. Orig. 1926. Sept. 20. Vol. 99. No. 7-8. pp. 518–545. [31 refs.]

A bouillon filtrate of *V. kadiköj* which contains both precipitinogen and haemotoxin (haemolysin) gives with specific antiserum a precipitum containing almost all the toxin. If the specific serum contain antitoxin, then the toxin-antitoxin combination is found in the precipitum. Now the haemotoxin of a bouillon culture is retained by a filter candle, while the precipitinogen passes through with the filtrate, and this negatives the idea of relationship of the one to the other. Addition of an antitoxic serum to the filtrate gives the usual precipitum, but the antitoxin now remains behind in the serum. That is to say, the antitoxin is not bound by precipitum, in the absence of toxin. But it is also found that an entirely non-specific flocculation, such as is given by bringing together horse serum and anti-horse serum, will remove both haemotoxin and precipitinogen from Kadiköj bouillon. Thus the disappearance of the toxin-antitoxin combination from a mixture of toxic bouillon and antitoxic serum must be due to adsorption of that combination by the flocculi representing the combination between precipitin and precipitinogen.

These facts were established by the use of old and fresh sera; sera containing only precipitin and sera containing both precipitin and antihaemotoxin; typical cholera sera, El Tor sera and serum obtained with a strain of *V. kadiköj*; toxin-containing Kadiköj bouillon and

toxin free bouillon of a typical cholera strain. It was also shown that there exist two different precipitinogens in Kadiköj bouillon, one of which is thermolabile and gives with its precipitin a large loose flock, while the other is thermolabile and gives a small granular compact precipitum.

This research is based on a relationship which has been supposed to exist between serum precipitinogen and its antibodies, a relationship which LANDSTEINER and PRASEK went as far as to maintain was identity. This again is based upon the fact of disappearance of antibodies such as antitoxin, antihaemotoxin and agglutinin from immune serum to which precipitinogen is added.

The research of the authors has also its backward reference to the work of NICOLLE, CESARI and DEBAIN and of RAMON, who have laid it down that when diphtheria toxin and antitoxin are brought together, maximum flocculation takes place in an exactly neutral mixture, which flocculation is the visible expression of combination of the toxin with the antitoxin. These views do not apply then to the case of haemotoxin and precipitinogen as contained in a toxic bouillon such as that given by *V. kadiköj*.

W. F. H.

KOVÁCS (Nikolaus). Zur Abtrennung und Differenzierung der Paracholerastämme von den echten Choleravibrionen. [**Differentiation of Paracholera from Cholera.**] *Ztschr. f. Immunitätsf. u. Experim. Therap.* 1926. Dec. 23. Vol. 49. No. 5. pp. 457–463. With 1 coloured plate. [29 refs.]

For over 20 years controversy has been carried on over the subject whether the El Tor strains of vibrio are true cholera vibrios or are related to the latter as the paratyphoids are to the typhoid bacillus. The *Vibrio el tor* cannot be separated serologically from *V. cholerae* and it both liquefies gelatin and produces indol. But the El Tor organism produces a powerful toxin and a haemotoxin. The discussion then reduces to one of whether all degrees of toxin and haemotoxin production may not be found among true cholera strains, which would connect up the common type of *V. cholerae*, yielding neither toxin nor haemotoxin, with the El Tor type. The haemotoxic character of a vibrio is demonstrable by the haemolysis of erythrocytes in blood media; unaltered oxyhaemoglobin can be shown by spectroscopic methods to be dissolved in the culture medium. Now true cholera vibrios, especially when freshly isolated, can often produce in solid blood agar media a zone of apparent haemolysis around their colonies. But this has been ascribed to digestion of erythrocytes, for oxyhaemoglobin is not demonstrable in the surrounding medium. The difference between lysis and digestion is more or less visibly manifest by this, that in the first case the colour is light red and in the second has a greenish tinge. The blood pigment seems to be converted by the cholera vibrio to haematin. This difference of action, if difference it be, is taken advantage of by Kovács to separate the two organisms by means of a special medium. Although the El Tor vibrio has such strong haemolytic power it is only the cholera vibrio which is regarded as breaking up the haemoglobin itself. El Tor acts on the corpuscles, not on the blood pigment. Thus when the blood has been coagulated by heat, its pigment, converted into methaemoglobin, is no longer soluble or diffusible and therefore, on a coagulated blood plate, El Tor

vibrios produce no zone of haemolysis around their colonies. In the case of such strains of *V. cholerae* however, as produce a clear transparent zone around their colonies on ordinary blood agar, and so resemble El Tor vibrios, the zone-producing action is still manifest even on a methaemoglobin medium. This is made the principle of differentiation by the author. The medium is prepared by adding 1·5 to 2 cc. sheep's blood to 10 cc. hot nutrient agar. In 12 hours colonies of cholera of the type specified already show on this Voges' medium a dark violet hue, before the development of any surrounding zone. Thus the two types of vibrio can be separated by the use of simple blood agar along with methaemoglobin agar without spectroscopic examination.

W. F. H.

VAN LOGHEM (J. J.). Bakteriophage und hämolytisches Endotoxin des Cholera-Vibrio. **Bacteriophage and Haemolytic Endotoxin of the Cholera Vibrio.** *Cent. f. Bakt.* I. Abt. Orig. 1926. Oct. 8. Vol. 100. No. 1-3. pp. 19–21. [5 refs.]

The *Vibrio cholerae* is to be sharply differentiated from *Vibrio tor* by quantitative and qualitative tests applied to the haemolysis produced. That of *V. cholerae* is weak and slowly produced, while that of *V. tor* is strong and quickly produced. A drop of goat's blood is haemolysed in 3½ hours by a 3-day culture of Tor vibrios and not for 8 days by cholera vibrios. But other differences are present: Tor haemolysin is thermolabile (inactivated after 1 hr. at 65° C.) and antigenic (giving rise to antihaemolysin), while cholera haemolysin is neither. Thus the evidence points to the existence of an exohaemolysin in the Tor vibrio, as is also the case for water vibrios, and yet the former are agglutinated by cholera serum, whereas the latter are not. That we are only dealing with an endohaemolysin in the case of *V. cholerae* receives confirmation from the action of cholera bacteriophage in accelerating haemolysis. Thus cholera vibrio filtrate from a culture which had been treated with bacteriophage gave rise to haemolysis of goat's blood in 5 or 6 days as against 8 or 9 days for the culture which had not been so treated. On these grounds *V. cholerae* and *V. tor* are regarded as two different species of organisms.

W. F. H.

JERMOLJEWA (S.). *Vibrio phosphorescens* beim klinischen Bilde der Cholera und sein Zusammenhang mit anderen Vibrionen (*V. phosphorescens*: **its Relation to** *V. cholerae* **and other Vibrios**. — *Cent. f. Bakt.* I. Abt. Orig. 1926. Oct. 30. Vol. 100. No. 4-6. pp. 170–177. With 1 plate.

This investigation has reference to 5 strains of *V. phosphorescens*, which were isolated during a cholera epidemic. Three of them were obtained from cases of typically clinical cholera in which no other vibrio was found. One was derived from a case of gastro-enteritis and another from the gall-bladder of a case of typhoid fever. Research is made, through morphological, biochemical, serological and immunological characters, to establish relationship between this vibrio, the phosphorescent vibrio of water, and *V. cholerae*. The cholera vibrio is not phosphorescent. There is little doubt, however, of the close relationship with the water vibrio, and there are somewhat striking

direct and cross protective affinities with the cholera vibrio. The author's contention is that *V. phosphorescens*, a water vibrio, may be pathogenic to man in greater or less degree, so as to give rise on occasion to cholera or gastro-enteritis, and that man may become a true carrier of this organism.

W. F. H.

Lal (R. B.) & Yacob (M.). **The Relative Suitability of Certain Foodstuffs as Media for the Cultivation of *V. cholerae* with Special Reference to their Relative Rôle in the Dissemination of Cholera.**—*Indian Jl. Med. Res.* 1926. Oct. Vol. 14. No. 2. pp. 245–255. With 1 text fig.

A fixed amount of serial dilutions of cholera emulsions is added to the various food stuffs, made up to uniform volume and then tested for growth in peptone solution or for number of colonies given by the highest dilution in Esch's medium.

W. F. H.

Nobechi (Keizo). Sur la préparation du bactériophage pour le vibrion cholerique et la classification de ces vibrions au point de vue du phénomène de bacteriophage. [**Preparation of Cholera Bacteriophage. Classification of Vibrios according to Bacteriophage Characters.** —*C.R. Soc. Biol.* 1926. Nov. 26. Vol. 95. No. 34. pp. 1250–1252.

Crossed experiments, in which 18 filtrates of bouillon cultures were placed, each with each, in contact with 18 strains of *V. cholerae*, showed that 3 of these were spontaneously lysogenic: they exhibited typical bacteriophage phenomena. Lysis began after about 3 hours and reached its maximum about the 4th or 5th hour. Thus it was essential to examine the cultures continuously from the beginning, as otherwise secondary growth masked the lysis. Three types emerged from the examination of these strains—6 resistant and non-lysogenic, 9 sensitive and non-lysogenic, 3 resistant and lysogenic. Absorption experiments showed that the sensitive strains took up bacteriophage while resistant did not.

W. F. H.

Nobechi (Keizo). Sur la signification du bactériophage pour le vibrion cholérique. [**Importance of the Bacteriophage for the Cholera Vibrio.**]—*C.R. Soc. Biol.* 1926. Nov. 26. Vol. 95. No. 34. pp. 1252–1254.

Changes in the form of colonies of *V. cholerae* brought about by the action of the lytic principle are not permanent. Reversion takes place to the ordinary form after some passages in the media containing bacteriophage and at the same time the strain becomes resistant. The strains made resistant in this way become with subculture non-lysogenic. The strain developed is spontaneously agglutinable and gives a deposit in bouillon with perfectly clear supernatant fluid. The appearance then of the culture is such as would make one hesitate to call it *V. cholerae*. Colonies of the cholera vibrio thus developed, when sown on agar and kept without subculture, lose their spontaneous agglutinability.

Intraperitoneal inoculation in guineapigs of 0·3 to 0·5 cc. of bacteriophage culture protects the animal against 3 to 10 M.L.D. of a virulent culture. In every case Pfeiffer's phenomenon has been positive. But in those where treatment by bacteriophage did not protect the guineapigs the vibrios recovered P.M. were always of the resistant sort. Filtrates of cultures, both lysogenic and non-lysogenic, have only slight protective power.

W. F. H.

Hahn (Martin) & Hirsch (Julius). Gewinnung und Prüfung von Choleragift. (II. Mitteilung.) [**Procural and Testing of Cholera Toxin.**]—*Klin. Woch.* 1927. Feb. 12. Vol. 6. No. 7. pp. 312–313. With 3 text figs. [1 ref.]

Toxin solutions lose potency in a few days. A stable dried toxin, killing a 250-gm. guineapig intraperitoneally in a dose of about 30 mgm. in 12 to 24 hours, was obtained. Purification by dialysis reduced the dose to 1–2 mgm. Subcutaneous injection also killed, although in 5 to 10 times the dose, with onset of symptoms after 24 hours incubation. The dried toxin, when tested upon isolated rabbit intestine produced, in concentration of 0·0006 to 0·02 per cent., shortening of the amplitude of contraction and eventually complete spastic paralysis.

W. F. H.

Kabeshima (Tamezo). **On a New "Kamanuki" Specific Medium for** *Cholera vibrio*, **Hemoglobin-Soda-Agar Medium.** *Tokyo Iji-Shinshi* (*Tokyo Med. News*). 1926. Aug. No. 2484. [Summarized in *Japan Med. World*. 1926. Dec. 15. Vol. 6. No. 12. pp. 351–352.]

This medium can be simply prepared without any steam sterilization as follows :—

(1) Prepare a 3 per cent. solution of agar in tap water and boil for 1 hr.; (2) Add to 80 cc. of the dissolved agar 2 gm. broth, 1 gm. peptone, 0·5 gm. sod. chloride and 18 per cent. crystalline sod. carbonate solution; (3) cool the medium in water, shaking it all the while; (4) add 3 gm. either Beufer or Shinoda's haemoglobin extract, dissolved in 10 cc. tap water, to the medium at 50° C.; (5) make plates and dry in incubator.

W. F. H.

Ko-Ran. Ueber den Typus der im laufenden Jahre beobachteten Cholerabazillen, und einige Versuche ueber Cholerarot-Reaktion. [**Current Types of** *V. cholerae*; **the Cholera-Red Reaction.**] *Taiwan Igakkai Zasshi* (*Jl. Med. Assoc. Formosa*). 1926. Dec. No. 261. German summary pp. 3–4. [In Japanese.]

The cholera vibrios isolated were atypical. For the cholera-red reaction a 0·25 per cent. peptone water of pH 7 was found the most suitable.

W. F. H.

Yui (C. Voonping). **A Few Practical Hints for the Clinical Diagnosis and Treatment of Cholera.** *Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress, Tokyo, 1925.* Vol. 2. pp. 765–773.

This is a general review of cholera emphasizing the need for early diagnosis at the beginning of an epidemic and describing treatment suitable for the different stages of the disease. If possible a cholera patient should be isolated as long as he is passing cholera vibrios [cr. this *Bulletin*, Vol. 23. p. 613 (Yui)].

J. H. T. W.

TROPICAL OPHTHALMOLOGY:

A REVIEW OF RECENT ARTICLES.—VII.*

The Eyelids.—Wright[1] recommends tarsorrhaphy to the general practitioner as a means of combating a harmful exposure of the cornea due to lid injury, leprosy, removal of the Gasserian ganglion, proptosis, etc. The small operation is simple and calls for no knowledge of plastic surgery; whilst it may often save an eye which otherwise would be lost.

Conjunctiva.—Fahim Girgis Ibrahim[2] met with a number of cases of membranous conjunctivitis at Rod el Farag and at Suez during the second half of 1925. The average age of the patients was about one year, and as many as fourteen cases were in hospital at one time. In only 22 cases was the diphtheria bacillus demonstrated by culture. Most of these were of a mild type as only one eye was lost. Gonococci were found alone in smears taken from eight cases, and in association with the Koch-Weeks bacillus in one. From his experience of this epidemic of membranous conjunctivitis the writer concluded (1) that the degree of severity of the case is no guide as to the probable bacteriological findings, since sometimes the diphtheria bacillus may be found in mild cases and not in severe ones; and (2) that, owing to culture methods, or to the antiseptics used in treatment, bacilli, which show the morphological and cultural characteristics of diphtheria, may lose virulence and become non-lethal to guineapigs. When working in Madras the reviewer formed the opinion that the virulence of the diphtheria bacillus was lowered by the tropical climate, and that mild infections occurred there more commonly than was often supposed. Occasionally, when conditions were exceptionally favourable to the disease, a higher degree of virulence developed and more typical cases were encountered; but these were seldom so severe as those ordinarily met with in a temperate climate.

Trachoma. Taboury[3] divides conjunctival inflammations which show cell inclusions into two classes: (1) Trachoma; (2) blenorrhoea neonatorum and swimming-bath conjunctivitis. Pannus and cicatrization are found in trachoma only. Both classes commence with an acute stage, and the inclusions disappear as the disease retrogresses. The presence of inclusion bodies in the cells of the limbus is pathognomonic of trachoma. Li[4] insists on the use of a loupe to examine the conjunctiva in the early stage of trachoma. Fine scars and any thickening of the membrane should be noted. [The injection of a syringeful of normal saline along the upper border of the tarsal plate will expose the fornix and render pathological changes more evident.] The onset of pannus in the upper region of the limbus is another sign to be looked for.

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* For the sixth of this series see Vol. 23, pp. 919–927.

1 Wright (R. E.). A Simple Method of dealing with Destructive Lesions of the Lids.—*Indian Med. Gaz.* 1927. Jan. Vol. 62. No. 2. pp. 12–13.

2 Fahim Girgis Ibrahim. Membranous Conjunctivitis.—*Bull. Ophthalm. Soc. Egypt.* 1926. pp. 55–59.

3 Taboury. The Question of Trachoma and its Agent.—*Harefuah.* Jerusalem. 1926. Oct.–Nov. Vol. 2. No. 1. English summary pp. V–VII. [In Hebrew pp. 312–328. With 3 text figs. Numerous refs.]

4 Li (T. M.). The Early Diagnosis of Trachoma.—*China Med. Jl.* 1926. Nov. Vol. 40. No. 11. pp. 1083–1085.

Feigenbaum[5] states that in Palestine two-thirds to three-quarters of the trachoma found amongst adults is due to an infection contracted during the first three years of life. The mother is a special source of infection to her child. He considers the infectivity of trachoma to be less than is commonly supposed, and that probably a number of unfavourable circumstances, to which the poor are especially subject, must be simultaneously present in order to provoke an attack. Trachoma is particularly destructive when associated with secondary infections, and an antitrachoma campaign should therefore be directed against all infectious forms of eye disease. All methods of attack should be instituted simultaneously, the problem being chiefly one of social hygiene. But early treatment, energetically continued until the disease is cured, is required. The support of the teacher and of the trained District Nurse is necessary. The Hadasseh Medical Organisation has done much good work, and systematic school treatment has been carried out all over the country. In the Jerusalem schools active trachoma has diminished from a rate of 24·6 per cent. in 1914 to 11·5 per cent. in 1925. This reduction is all the more remarkable when the flow of immigrant infected children from the neighbouring countries (Persia, Kurdistan, Mesopotamia, etc.) is taken into consideration. The recurring epidemic of summer conjunctivitis causes an annual recrudescence of active trachoma. It is remarked that nasal disease aggravates trachoma; this adds yet another factor to be dealt with in the campaign against the complaint. Shimkin[6], also discussing the question of trachoma in Palestine, makes some further points. Since the disease prevails where there is much dirt and uncleanliness, it is rather more common in the Arab villages than in the towns, the sanitary conditions under which the Arab rural population lives being extraordinarily bad. The southern districts are more heavily infected than the northern. This is due to a lower rainfall, to a greater liability to conjunctival irritation by dust and sand from the desert, and to a poorer water supply. The summer epidemic of ophthalmia is largely caused by the Koch-Weeks bacillus. The author concludes that "the increase in the number of schools, particularly in the villages, combined with systematic treatment of the children attending them, appears to be the best means of dealing with trachoma in Palestine under present conditions. This is particularly applicable to the Arab population."

Grönholm[7] has twice investigated the disease as it occurs in Finland. On the first occasion in 1908 he was associated with E. Kuhlefelt and on the second in 1924 with Hjelmann. Some 170,000 persons were examined in all. Emigrants and inmates of schools, factories, prisons and workhouses furnished the material. He states that trachoma appears to have been rife in Finland for many years. It has been mentioned by writers in the middle of the eighteenth century; and in the first half of the nineteenth century at least half of the patients in the County Hospital at Vara were said to suffer from eye

[5] Feigenbaum (Arieh). Some Notes on the Problems and Results of the Jewish Campaign against Trachoma in Palestine.—*Arch. of Ophthalm.* 1926. Sept. Vol. 55. No. 5. pp. 453–460. With 2 graphs.

[6] Shimkin (N.). Trachoma in Palestine. Its Epidemiology and a Review of Measures for dealing with it.—*Brit. Jl. Ophthalm.* 1926. May. Vol. 10. No. 5. pp. 247–279. With 7 diagrams. [20 refs.]

[7] Grönholm (V.). The Occurrence of Trachoma in Finland formerly and at present.—*Acta Ophthalmologica.* 1925. Vol. 3. No. 1–2. pp. 1–11. With 2 maps & 3 charts.

disease—mostly neglected ophthalmias. In 1908 5 per cent. of the population were found to be trachomatous, and in 1924 1·5 per cent. It is interesting to note that the incidence amongst school children was small and only amounted to 3·8 per cent. in 1908 and to 0·9 per cent. in 1924. Workhouse inmates during the same periods showed an incidence of 24 per cent. and 15 per cent. This experience is in marked contrast to conditions in North Africa, and in the Near East where the school-children have been reported by some observers to be very heavily infected. The disease in Finland was found to be considerably more common in women than in men (in the proportion of 138 women to 100 men). Investigation showed that the disease is on the decrease. But this decrease is not continuous, and from time to time occasional waves of exacerbation occur. It is suggested that fluctuations in the virulence of the contagion may be responsible for this phenomenon. The general decrease may be attributed to improved hygiene and general conditions. The stringent American immigration laws also have been of service since intending emigrants now realize that it is important to prevent or to cure the disease.

How difficult the diagnosis of trachoma may sometimes prove is well demonstrated by a discussion between Bobbert[8] and Kopstein[9] regarding the prevalence of the disease in Ambon. The former found from 19 to 44 per cent. of the children in different schools affected. Only the mildest cases could be arrested after "a mechanical and intensively chemical treatment of some months." Whereas Kopstein found comparatively few cases of trachoma, but observed a follicular catarrh, which tended to recover without cicatrization, to be fairly common. He remarks that entropion and trichiasis are seldom seen amongst the adult population, and that a high incidence of trachoma is therefore unlikely. Experienced observers well know how closely a follicular catarrh, which has been over treated by irritant applications, may resemble true trachoma. The discussion is useful as it draws attention to the danger of an over active treatment in conjunctival inflammations.

Surgeons practising amongst dark-skinned races fairly often notice the presence of pigment in trachomatous scars, and possibly some may attribute it to the application of "native medicines." Herschendörfer[10] met with and carefully examined four cases of the condition and has discussed its probable cause. He is inclined to believe that the cellular tissue, blood, or lymph of such patients contains more chromogenic substance than is usual, and that the sluggish local circulation associated with scar formation affords an opportunity for oxydasis to occur and thus to give rise to pigmentation. MacCallan[11] advises that the conjunctiva should be painted daily with a 2 per cent. solution of silver nitrate in the early stages of trachoma. Should any coagulum or necrosis result, further paintings must be

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8 Bobbert (A. C.). On the most Frequent Eye-Diseases in Ambon (Trachoma).—*Meded. Dienst d. Volksgezondheid in Nederl.-Indië.* 1926. Pt. 4. pp. 483–484.

9 Kopstein (F.). Remarks on the Article by A. C. Bobbert on the most Frequent Eye-Diseases in Ambon (Trachoma).—*Meded. Dienst d. Volksgezondheid in Nederl.-Indië.* 1926. Pt. 4. pp. 485–488.

10 Herschendörfer (A.). Pigment Changes in the Conjunctiva of the Lids in Trachoma.—*Amer. Jl. Ophthalm.* 1926. Nov. Vol. 9. No. 11. pp. 812–822. With 5 text figs. [17 refs.]

11 MacCallan (A. F.). The Treatment of Trachoma.—*Lancet.* 1926. Oct. 30. pp. 919–920. [1 ref.]

postponed until separation has occurred. Treatment must be continued for many months, and it is advisable from time to time to substitute cyanide of mercury 1 per cent., copper sulphate 10 per cent., or perchloride of mercury ·5 per cent. [It should be remembered that the long continued use of irritant applications, especially of silver nitrate, may prove harmful.] Expression should be performed when marked follicle formation occurs in the second stage, or combined excision if the case is complicated by spring catarrh. He recommends daily applications of 1 per cent. perchloride of mercury in the third stage when cicatrization has definitely begun and may be advanced. This may be alternated with a 10 per cent. solution of copper sulphate. Combined excision may prove helpful in this stage also.

Serotherapy is thought by Salvati[12] to be of some value in the treatment of the disease. He considers that, possibly, its favourable influence may be due to the presence of a special antitoxin. The serum should be injected beneath the conjunctiva in order to obtain the best result. He uses a minimal dose of one-quarter of a cc., and states that the injections are quite painless and free from any reaction ; they can therefore be repeated every second day. [When estimating the effect of a treatment of this nature the observer must not lose sight of the fact that a simple injection of normal saline solution is often beneficial owing to the stretching of the conjunctiva and the lymphagogic action produced by it. An injection, too, renders it easy to apply drugs efficiently to the ballooned out membrane.]

Naróg[13] tested the absorptive action of pepsin upon cicatrices of the lids, trachomatous pannus and leukomata of the cornea and obtained a positive effect. He found that a combination of the pepsin with a dilute acid rendered the drug more active. It is a little difficult to make out exact details of the technique from his description. Apparently a 1 per cent. solution of pepsin was combined with a ·3 per cent. solution of HCl and an equal quantity of novocaine and adrenalin solution was added to the mixture. This was injected directly into the cicatrices. The injection was repeated in from three to six days according to the amount of reaction elicited. Severe pain lasting for some hours is caused by a large dose. For this reason small doses are recommended.

De Liebermann[14] has published a further description of a method of lid fixation which he has found of special service in Blaskovic's operation of turning the tarsus in cases of cicatricial entropion caused by trachoma. He uses a broad, T-shaped spatula. The horizontal limb of the instrument is provided with three projecting knobs, or screws, to which threads can be readily fixed. One of these knobs is placed near each extremity of the limb and the third at the middle. Fine threads are passed, mattress fashion, 1 mm. from the lid margin. The thread is entered on the conjunctival surface, made to emerge through the skin, and re-entered at a point 2 mm. to the side of its exit. Three such sutures are used. The lid is everted upon the vertical limb of the spatula, and is drawn up taut and fixed in position

12 Salvati. La sérothérapie dans le trachome. —*Ann. d'Oculistique.* 1926. Aug. Vol. 163. No. 8. pp. 613–623. With 8 text figs. [4 refs.]

13 Naróg (Frank). Experimental and Curative Application of Pepsin in Eye Diseases.—*Amer. Jl. Ophthalm.* 1926. Oct. Vol. 9. No. 10. pp. 746–751.

14 de Liebermann (L.). Method of Thread Fixation of the Lid in Tarsus Operations.—*Arch. of Ophthalm.* 1926. Sept. Vol. 55. No. 5. pp. 461–464. With 1 text fig. [7 refs.]

by tying each double thread to its appropriate knob on the horizontal limb. The whole cicatrized tarsus is thus stretched out flat and can readily be dealt with.

The Revue Internationale du Trachome for October 1926 contains a description by AUBARET and MASTIER[15] of hyperplastic growths which they sometimes observed in eyes affected by cicatricial trachoma. In one case the greater portion of the growth was composed of masses of hyaline degenerative matter which failed to give an amyloid reaction. DE GRÔSZ[16] refers to the strenuous and successful work done by MACCALLAN and his assistants in Egypt and expresses the hope that the benefits of this work would not be sacrificed under the conditions now prevailing. MORAX[17] describes a case of trachoma affecting one eye only in a Corsican girl aged 18. The case was remarkable for its severity and intractibility, and for the fact that the only source of infection appeared to be an infant who suffered from an eye disease the nature of which was unknown. AUBARET[18] presents the case of Marseilles with regard to the disease. This port, many of whose residents are already infected, is subject to a continuous invasion by trachomatous immigrants. The local resources are insufficient to cope with these. And he pleads that the State, in its own interest, should give financial assistance in order to deal efficiently with the plague. Elena PUSCARIU[19] recounts some of her observations in Roumania, and states she found that the eyes of those associated with trachomatous patients were seldom healthy. She recognizes three stages of the disease. In the first the changes are limited to the upper border of the superior tarsal plate and to the lower cul de sac. In the second ptosis appears and the membrane is swollen and more generally affected ; even the plica is thickened and the subject of vascular injection. The third stage is marked by the occurrence of cicatrization and its consequences. As regards secondary infections, 3·87 per cent. were caused by the Koch-Weeks bacillus, and in 86·6 per cent. unnamed micro-organisms were present. She states that she often found phlyctenular disease associated with trachoma. Emile JUNES[20] says that he found Koch-Weeks ophthalmia and purulent ophthalmia to be the two most destructive diseases of the eye in Sfax. They are often followed by trachoma and he suggests that they lower the resistance of the conjunctiva to that disease.

Cornea.—P. Chalmers JAMESON[21] recommends the use of a double

15 AUBARET & MASTIER. Végétations hypertrophiques et néoplasiques du trachome.—*Revue Internat. du Trachome.* 1926. Oct. Vol. 3. No. 4. pp. 123–128. With 2 text figs.

16 DE GRÔSZ (Émile). La lutte contre le trachome en Egypte.—*Revue Internat. du Trachome.* 1926. Oct. Vol. 3. No. 4. pp. 129–130.

17 MORAX (V.). Trachome unilatéral. Contamination de l'adolescence. Forme tenace.—*Revue Internat. du Trachome.* 1926. Oct. Vol. 3. No. 4. pp. 131–133.

18 AUBARET. Organisation d'un centre antitrachomateux.—*Revue Internat. du Trachome.* 1926. Oct. Vol. 3. No. 4. pp. 133–138.

19 PUSCARIU (Elena). Le trachome.—Etude clinique. Symptomes. Formes cliniques. Affections associées. Evolution, durée, pronostic. Diagnostic.—*Revue Internat. du Trachome.* 1926. Oct. Vol. 3. No. 4. pp. 141–158. With 2 text figs.

20 JUNES (Emile). Six années d'oculistique et de lutte antitrachomateuse au dispensaire de la croix rouge de Sfax.—*Revue Internat. du Trachome.* 1926. Oct. Vol. 3. No. 4. pp. 168–172.

21 JAMESON (P. Chalmers). The Surgical Treatment of Wounds of the Cornea with Prolapsed Iris.—*Arch. of Ophthalm.* 1926. Sept. Vol. 55. No. 5. pp. 465–469. With 5 figs. on 2 plates.

triangular *conjunctival flap to cover a corneal wound*. A straight incision, starting at a point on the limbus which corresponds to the top of the vertical meridian of the cornea, is carried back directly to the fornix, and secondary circumcorneal incisions are then made from the same point on the limbus. The extent of these latter depends upon how much of the cornea it is necessary to cover. The flaps are next under-mined and raised from the globe. Two triangular flaps are thus fashioned whose apices correspond to the point on the limbus at which the first incision started. The apex of one flap is now drawn over the cornea and is sutured to the sclera at the point where the circumlimbal incision on the opposite side terminated. Two or three sutures may be required to hold the flap in place over the cornea. The second flap is next drawn over the one already placed in position, and is sutured to the conjunctiva at the limbus. The wound is thus covered by a double layer of membrane. The superficial flap usually retracts in the course of about three days and the deep one follows suit a little later. JAMESON frequently replaces a prolapsed iris by passing a spatula into the anterior chamber through a secondary incision, and then employing traction from within the chamber together with pressure on the cornea.

E. WOLFF[22] has recorded two cases of *lime burn of the cornea* which he successfully treated by the application of a 10 per cent. solution of neutral ammonium tartrate. Preliminary cocainization is necessary if the eye is injected. The freshly prepared solution of neutral ammonium tartrate is instilled slowly from an undine for about 15 minutes every day. He states that even cases of long standing may be benefited by the treatment which should be continued for a long period. The insoluble calcium carbonate appears to be converted into the slightly soluble calcium tartrate. The treatment rather reminds one of that recommended by ELLIOT[23] for lead incrustation of the cornea. Here the leukoma is scraped and the denuded surface is flushed with a strong aqueous solution of sulphuretted hydrogen.

Cataract.—Conrad BERENS and Ray R. LOSEY[24] believe that conjunctival suturing is a safeguard against many of the complications encountered in cataract extraction, and they have described a technique which they claim is free from the disadvantages of the suture as ordinarily employed. A continuous circumcorneal suture of waxed silk is used ; each extremity of this is placed in the horizontal meridian of the globe, at a point 8 mm. from the limbus, and is left untied. Seven bites of bulbar conjunctiva are picked up by the suture. Two of these are placed on each side, parallel and close to one another, in such a way as partially to fix each end of the thread ; one is situated close to the limbic attachment of the conjunctival bridge flap ; one lies on the nasal side 8 mm. from the cornea and 8 mm. from the vertical meridian, whilst another lies is a similar position on the temporal side.

22 WOLFF (E.). The Treatment of Lime-Burns of the Cornea by 10 per cent. Neutral Ammonium Tartrate.—*Brit. Jl. Ophthalm.* 1926. Apr. Vol. 10. No. 4. pp. 196–197. [4 refs.]

23 ELLIOT (R. H.). A Case of Lead Opacity of the Cornea treated by the Application of a Solution of Sulphuretted Hydrogen.—*Ophthalmoscope.* 1911. Vol. 9. pp. 498–499.

24 BERENS (Conrad) & LOSEY (Ray R.). An Untied Conjunctival Suture and Conjunctival Bridge in Cataract Extraction. Results and Conclusions.—*Brit. Jl. Ophthalm.* 1926. Nov. Vol. 10. No. 11. pp. 577–591. With 7 text figs. [31 refs.]

The conjunctiva is first buttonholed by a narrow-bladed scissors at a point 8 mm. above and 8 mm. temporal to the upper end of the vertical meridian of the cornea in the case of the right eye, or at a similar point on the nasal side in the case of the left eye, and the membrane surrounding the upper quarter of the cornea is undermined. The first three insertions of the suture are then made, a long loop being left between the first and second insertion. The section is next performed and care is taken to fashion a wide conjunctival bridge which is left temporarily attached. The suture is now completed by passing it through the bridge and three times through the bulbar conjunctiva as described above. The conjunctival pier of the bridge is then divided and the lens delivered. After the delivery of the lens and the toilet of the wound have been effected the wound is closed by pulling on the loop. The ends of the suture are drawn taut and are held in place on the nose and on the temple by means of collodion. Many surgeons having Eastern experience are likely to regard somewhat doubtfully the use of any form of suture in cataract extraction. Its employment adds a complication to the operation and introduces a possible source of sepsis or irritation. Cases in which the support of a suture is likely to be required may often be dealt with by the use of a conjunctival bridge which is free from these objections. It must be admitted that the use of a bridge flap renders lens delivery and other manipulations rather more difficult. But difficulties disappear if proper counter-pressure is employed and little care is exercised. Preliminary iridectomy and capsulotomy with a Bowman's needle immediately before making the section are steps which render extraction beneath a conjunctival bridge flap easier and safer.

Strother Smith[25] has made some helpful notes on ophthalmic work. Regarding cataract, he deprecates any prolonged preparation of the patient for the operation as he thinks such may produce a loss of control in a nervous person. Unnecessary directions should be avoided and the patient on no account should be told to look downwards whilst the lens is being expressed in the course of an intracapsular operation. He insists upon the danger of prolonged, purely medicinal treatment of glaucoma. He lays down a most valuable maxim which should be taken to heart by every tyro: "Don't overdo the treatment of chronic trachoma [or any other form of conjunctival inflammation] by applying strong solutions of silver nitrate or pure copper sulphate too often."

Occasionally the Indian coucher may adopt a rather elaborate procedure. Narayana Rao[26] saw a patient who had undergone some preliminary treatment by a hakim. On the first visit the coucher instilled some drops and inserted a conjunctival suture of ordinary thread with a sewing needle. This suture was tied and left long. Three subsequent daily visits were paid, and at each of these drops were instilled and some medicine applied to the skin around the eye. On the fourth day the lens was couched, a cloth being held over the heads of patient and coucher during the operation. Possibly the suture may have been used to fix the globe during couching and the instillations have been made for the purpose of disinfection. The

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25 Smith (F. F. Strother). A Few "Don'ts" in Ophthalmic Work.—*Indian Med. Gaz.* 1926. Nov. Vol. 61. No. 11. pp. 531–533.

26 Narayana Rao (B. K.). A Curious Preliminary "Treatment" for Couching for Cataract.—*Indian Med. Gaz.* 1926. Sept. Vol. 61. No. 9. p. 446. With 1 text fig.

use of the cloth, however, suggests that the whole ritual was intended to impress the public.

Henry SMITH[27] says he has found subconjunctival extraction, stitched conjunctival flaps, and corneal stitches all to be inefficient as a means of preventing iris prolapse. He has tried with some success the effect of making three small peripheral iridectomies before expressing the lens in its capsule. These are placed at ten, twelve and two o'clock respectively. He gives a dose of 80 to 100 grains of potassium bromide the night previous to operation in order to lessen the risk of squeezing as he thinks the induction of orbicular paresis by novocaine injections may predispose to eversion of the corneal flap. He considers it advisable to postpone excision of a prolapse until twelve or fourteen days after the extraction has been performed.

CRUICKSHANK[28] has made careful notes upon 82 cases of iritis which occurred within ten days of operation among 1,250 cataract extractions performed at Shikapur. He concludes that the complication mostly resulted from the retention in the chamber of protein matter belonging to the blood plasma or to the crystalline lens. And that such inflammation is more likely to occur in individuals who are specially sensitive to protein. It is interesting to note that the iritis appears to have been almost as often associated with retention of blood as it was with retention of capsule and cortex. CRUICKSHANK has not discussed in his paper the possible influence of any associated bacterial infection as a contributing cause of the iritis. It is difficult entirely to eliminate this factor; and it is conceivable that a low grade infection, such as would be easily repelled by the tissues under ordinary circumstances, might obtain a foothold if the local resistance was lowered by the presence of blood clot or lens cortex.

BANAJI[29] says that after a personal experience of 800 intracapsular operations performed after Smith's method, he reverted to capsulotomy. He formed the opinion that panophthalmitis, secondary glaucoma, detachment of the retina, and late infections occurred with greater frequency after Smith's operation. He administers 60 grains of calcium lactate daily on the two days preceding operation and 20 grains on the day of operation. If high blood-pressure, diabetes or glaucoma are present, 2 cc. of haemoplastin is injected an hour before operation. Should the surgeon have the slightest misgiving regarding the possibility of infection, 10 cc. of boiled milk is injected immediately after operation into the outer side of the thigh as a precautionary measure.

JAVA[30] states that intravenous injections of tincture of iodine have proved satisfactory in some of his cases of purulent infection of the wound after extraction of cataract. He uses 5 minims of tincture of iodine in 5 cc. of distilled water.

TEWFIK[31] has given some useful hints to beginners on the subject of cataract extraction. He stresses the importance of preliminary

27 SMITH (Henry). The Treatment of the Iris in Cataract Operations.—*Arch. of Ophthalm.* 1927. Mar. Vol. 56. No. 2. pp. 105–109.

28 CRUICKSHANK (M. M.). Iritis following Cataract Extraction.—*Indian Med. Gaz.* 1926. Oct. Vol. 61. No. 10. pp. 490–493. [7 refs.]

29 BANAJI (B. P.). Avoidance of Post-Operative Infection in Cataract Operations.—*Brit. Jl. Ophthalm.* 1927. Feb. Vol. 11. No. 2. pp. 75–78.

30 JAVA (K. G.). Notes in Ophthalmic Practice.—*Indian Med. Gaz.* 1927. Feb. Vol. 62. No. 2. p. 84.

31 TEWFIK (M.). Some Hints on Senile Cataract Extraction Operation.—*Bull. Ophthalm. Soc. Egypt.* 1926. pp. 66–73.

examination and treatment. He paints the conjunctiva of his patients two hours before operation with a 2 per cent. solution of silver nitrate as a routine measure. He recognizes the value of a sufficiently large section. But he deprecates the use of a conjunctival bridge flap since he thinks it interferes with the delicacy of the operation.

In the experience of most surgeons operations for the relief of a secondary cataract following an extraction may sometimes prove troublesome and may not always achieve the desired aperture. The technique described by J. M. Wheeler[32] seems rather alarming at first sight; but the reviewer can testify as to its safety and efficacy when employed by its originator. Whilst the patient looks downwards, a special, short, narrow-bladed, and very sharp knife is passed through the cornea, 1 mm. from the limbus, and across the chamber until its point reaches the opposite edge of the dilated pupil. The surgeon then thrusts his hand, which holds the knife, and forearm straight forward, so that the knife, pivoting between his thumb and first finger, sweeps across the chamber and emerges at the site of entry. The knife-point thus passes along an arc of a circle and the blade delivers a true drawing cut. The speed at which the cut is made overcomes the yielding of an elastic membrane. Essential features are: (1) The knife should be held *very lightly* two inches from its point; (2) no overlapping of the pulps of the forefinger and thumb round the handle of the knife must be permitted. Such overlapping would interfere with the free action of the blade by limiting the pivot action at the place where the handle is held. Exactly the same technique may be employed in performing an iridotomy. In this case the incision is planned to divide transversely any drawn up fibres of the iris. The size of the aperture may be limited by holding the knife a little closer to its point.

Glaucoma.—Madan[33] has reported the case of a woman, aged 55, who developed an acute glaucoma in a myopic eye following the continuous application of an ice-bag during thirteen days for a slight injury. He attributes the onset of glaucoma to an interference with the local circulation.

General Diseases.—

Malaria.— S. Popova[34] has recorded some of the ocular complications observed by him amongst his malarial patients in Turkestan. A superficial keratitis was the most common. Retinal haemorrhages occurred in a case of severe malignant tertian fever. He states that the various complications commenced soon after the attacks of fever, but were rarely seen during the actual attack, and that they usually terminated favourably.

Smallpox.—In a review of the ocular complications found in smallpox, de Andrade[35] states he found the limbus to be the most common seat of vesicle formation in the eye. The edges of the lids require

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32 Wheeler (J. M.). Secondary Cataract Opening by Single Straight Incision. Iridotomy by same Method.—*Trans. Amer. Acad. of Ophthalm. & Oto-Laryn.* 1924. Vol. 29. pp. 149-158.

33 Madan (K. E.). The Effect of Prolonged Application of Cold on the Eye.—*Indian Med. Gaz.* 1926. Dec. Vol. 61. No. 12. pp. 600–601.

34 Popova (S.). Maladies des yeux dans la fièvre paludéenne d'après les données de la clinique Ophtalmologique de l'Université de l'Asie Centrale.—*Jl. Méd. de l'Asie Centrale.* Taschkent. 1926. July. Vol. 5. No. 7. pp. 405–414. [11 refs.] [In Russian.]

35 de Andrade (Gabriel). Complicações oculares da variola.—*Brazil-Medico.* 1926. Nov. 20. Year 40. Vol. 2. No. 21. pp. 287–289. [9 refs.]

very careful cleansing and antiseptic eyewashes and ointments should be used. Of the latter a 2 per cent. picric acid ointment was found valuable.

Leprosy.—Marín Amat[36] remarks how frequently alopecia is met with in leprosy. He found colour blindness quite common, and often met with fibrillary contraction of the orbicularis whilst he rarely saw paralysis of the muscle. The sclerotic was chiefly affected in the neighbourhood of the limbus. He states that large lepromata tend to attack the periphery of the iris.

Amoebiasis.—Lloyd Mills[37] considers that an unsuspected amoebiasis may be sometimes the cause of chronic recurrent ocular disease, such as iridocyclitis, episcleritis, primary and secondary glaucoma, choroiditis, and conjunctivitis. He relies upon the beneficial effect of emetine following the discovery of the presence of the parasite to support his theory.

Ankylostomiasis.—Little[38] reports a case of *double optic neuritis* for which he could find no cause other than the existence of a hookworm infection. The patient, a soldier, suffered from severe headache and vomiting. The blood changes were very slight, and the Wasserman reaction was negative. Consecutive atrophy occurred ; but the vision recovered from light perception to 6/24 in each eye. Whilst it must be admitted that improvement followed the expulsion of the parasites, one hesitates to accept ankylostomiasis as the sole cause of the neuritis.

Miscellaneous.—To render painless a blind, painful eye, without sacrificing the organ, is a service even more appreciated by a patient belonging to a backward community than by one whose lot is cast in a more civilized country. Optico-ciliary neurectomy is not always entirely satisfactory, and the use of *retrobulbar injections of alcohol* as described by Jaensch[39] may find a place in the practice of eye surgeons in the tropics. He claims to have obtained a good result in 27 out of 29 cases. Thirteen of his patients suffered from primary glaucoma and 16 from secondary glaucoma ; and all were of long standing. Grüter's technique was employed. After anaesthetizing the eye, a special curved needle is entered beneath the conjunctiva and pushed round the globe until its point lies at the posterior pole of the eye. 1 cc. of 70 per cent. alcohol is then injected. Two separate injections are made, one being entered in the lower and inner quadrant, and the other in the upper and outer. Some paresis or paralysis of the ocular muscles occurred occasionally, but these symptoms never lasted longer than three months. Pain is experienced for a few seconds, but numbness comes on after half a minute.

Drug idiosyncracy in a patient subjected to an eye operation may prove troublesome and disconcerting. Atropine irritation is, of course,

[36] Marín Amat (Manuel). Contribución al estudio de la lepra ocular.—*Siglo Méd.* 1926. Sept. 18, 25 & Oct. 2. Year 73. Vol. 78. Nos. 3797, 3798 & 3799. pp. 257–261 ; 284–287 ; 310–314. With 4 text figs. [26 refs.]

[37] Mills (Lloyd). Ocular Disease occurring in the Course of Nondysenteric Amebiasis.—*Jl. Amer. Med. Assoc.* 1926. Oct. 9. Vol. 87. No. 15. pp. 1176–1182. [23 refs.]

[38] Little (J. P.). A Case of Optic Neuritis, caused presumably by *Ankylostoma duodenale* Infection.—*Jl. Roy. Army Med. Corps.* 1927. Jan. Vol. 48. No. 1. pp. 61–63.

[39] Jaensch (P. A.). Die retrobulbäre Alkoholinjektion nach Grüter. Klinische Beobachtungen und experimentelle Untersuchungen.—*Ztschr. f. Augenheilk.* 1925. Vol. 58. pp. 1–11. [7 refs.]

that most commonly observed by the eye surgeon. M. M. El Bakry[40] found in a patient whom he trephined a hypersensitiveness to mercuric chloride lotion 1 in 5,000. Two days after irrigation with the lotion a condition resembling erysipelas of the face developed. The eye was unaffected and the attack subsided in the course of five days. In another patient, operated on for trichiasis, a papular eczematous rash appeared. This proved to be caused by iodine. Bakry found that, in these cases, the skin alone was affected and that the mucous membranes of the gums and cheek displayed no abnormal sensitiveness to the drugs.

Ophthalmomyiasis.—Zeeman[41] has described an eye removed from a boy in Zutphen owing to the occurrence of a destructive inflammation. Examination revealed that the inflammation was due to penetration of the globe by a dipterous larva. The iris showed spots of atrophy, the vitreous body was shrunken, the retina was detached and was perforated on the temporal side. Beneath the detached retina lay the spined and segmented body of a dipterous larva which measured 6 mm. by 1·5 mm. It was possible to identify a gut and two tracheae.

Favourable reports have been made from time to time regarding the use of *Besredka's bouillon-vaccine* in the conjunctival inflammations of man. Nicolas[42] has extended its application to veterinary work with excellent results. The bouillon-vaccine, which is a broth freed of the micro-organisms (staphylococci, streptococci, pneumococci) which have been cultivated in it, is instilled thrice daily in the case of superficial ocular inflammations. In iridocyclitis it acts better when injected subconjunctivelly. In choroiditis and in panophthalmitis Nicolas uses injections into the anterior chamber. He considers the beneficial action of the broth in cases of ocular infection, especially those of traumatic origin, to be undoubted.

Fleury[43] has reported a case of a *cysticercus in the vitreous humour* of a Brazilian—a native of Tieté. The movements of the head could be easily seen with the ophthalmoscope. The cysticercus was successfully extracted and the diagnosis was confirmed by pathological examination.

Reports. Report of the Eye Clinic Mulago (Uganda). Dr. Owen[44] remarks upon the prevalence of trachoma in the district. No cases of interstitial keratitis or of disseminated choroiditis were seen, and senile cataract and glaucoma were comparatively rare.

H. Kirkpatrick.

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40 El Bakry (M. M.). Description of Two Cases of Idiosyncrasy.—*Bull. Ophthalm. Soc. Egypt.* 1926. pp. 80–82.

41 Zeeman (W. P. C.). Ophthalmomyiasis subretinalis.—*Nederl. Tijdschr. v. Geneesk.* 1926. Sept. 11. 70th Year. 2nd Half. No. 11. pp. 1192–1197. With 7 figs. on 1 plate.

42 Nicolas (E.). Prévention et traitement des infections oculaires des animaux à l'armée française du Levant par les bouillons-vaccins de staphylocoques et streptocoques associés.—*Ann. Inst. Pasteur.* 1926. Dec. Vol. 40. No. 12. pp. 1075–1079. [1 ref.]

43 Fleury (Gastão). Provas biologicas realizadas em um caso de cysticercose ocular.—*Brazil-Medico.* 1926. July 31. Year 40. Vol. 2. No. 5. pp. 61–62. [1 ref.]

44 Owen (H.B.) Report on the Eye Clinic for 1925. *Uganda Protectorate Ann. Med. & San. Rep. for the Year ended 31st December, 1926.* pp. 77-78.

RABIES.

International Rabies Conference.

The International Rabies Conference convened by the Health Organization of the League of Nations met in Paris from May 25th to 30th, 1927. The meetings were held, at the Pasteur Institute, which by the courtesy of the French Officials had been offered for the purpose. It was peculiarly fitting that nearly fifty years after PASTEUR conducted his initial experiments on rabies, those who had carried his methods into all parts of the world should render an account of their stewardship in his own laboratory. Some sixty delegates were present, collected from all nations and speaking many tongues.

The Conference was opened by Professor ROUX, and addresses were delivered by Professor MADSEN on behalf of the League of Nations, and by Professor CALMETTE. The terms of reference had been carefully considered and published in book form. Copies had been circulated amongst the delegates. Professor MARIE wrote a chapter on the Nature of the Virus, and another on Methods of Treatment, Dr. REMLINGER on Paralytic Accidents, and Professor VALLEE on Canine Rabies. It was decided that the subject matter under discussion should be considered under these four heads, and their discussion was relegated to four commissions. These met at different times, so that each meeting could be attended by all delegates.

The Presidents of the first commission were BORDET (Brussels) and KRAUS (Vienna); of the second, MCKENDRICK (Edinburgh) and BUJWID (Krakow); of the third, PFEIFFER (Breslau) and ZLATOGOROFF (Kharkew); of the fourth, DI VESTEA (Pisa) and KITAJIMA (Tokio). The second and third sections were subsequently amalgamated. Meetings were held morning and afternoon throughout the week, and at the closing meeting the following resolutions were unanimously adopted.

RESOLUTIONS ADOPTED BY THE FIRST COMMISSION.

NATURE OF THE RABIC VIRUS.

"1. The Commission considers that the rabic virus is a filterable virus; the difficulties sometimes experienced in the filtration are, in its opinion, due to the clogging of the 'bougies' by fatty globules contained in the emulsion of nervous tissue and to the small size of the pores of the filters.

"2. The Commission, after examining the microscopic preparations presented by Prof. Levaditi and Manouelian does not consider it desirable to pass an opinion as to the nature of the virus and decide whether it is a protozoon or a bacterium.

"It does not consider itself in a position to decide whether negri bodies represent a stage in the evolution of a living micro-organism or are produced by cellular reaction or degeneration."

RESOLUTIONS ADOPTED BY THE SECOND AND THIRD COMMISSIONS.

"The Conference, having considered the results obtained by the various methods of anti-rabic treatment now employed in the different Institutes represented at the Conference and the advantages and disadvantages of each, have arrived at the following conclusions:

"1. There is unanimity of opinion regarding the efficiency of Pasteur treatment by the original dried cord method and by the glycerinated cord method of immunization.

"2. It is also agreed that living fixed virus injected under the skin is innocuous to man in the vast majority of cases; in exceptional circumstances, however, it may be infective. For this reason, certain Institutes have adopted the use of a dead or attenuated vaccine. Such vaccines killed or attenuated either by carbolic acid or ether produce a satisfactory immunity.

"3. The etiology of paralytic symptoms which have, in rare cases, been observed as a sequel of antirabic inoculations, have been fully discussed and the experiences of the different Institutes regarding this matter have been compared.

"In the present stage of our knowledge it is not possible to make definite assertions as to the etiology of these phenomena.

"Among predisposing causes, alcohol, syphilis, neuropathic constitution, cold, fatigue, and overwork are important.

"The symptoms have been most commonly observed in persons of between 20 and 60 years of age, belonging to intellectual professions. Cases have been relatively rare among the indigenous races of tropical countries, and among children.

"Such paralytic accidents are less frequent if glycerinated or carbolized vaccines be employed.

"The brain of every human case that has died of intercurrent disease, during or shortly after the termination of treatment, should be examined for the presence of street or fixed virus. Such examinations are specially important if the case has exhibited paralytic symptoms.

"4. Opinion is equally divided as to the necessity of submitting to anti-rabic treatment persons whose skin has come into contact with the saliva of a rabid animal (or human being suffering from hydrophobia), if there be no visible break in the continuity of the skin surface. The great majority of the Conference are agreed, however, as to the necessity of treatment whenever a mucous membrane is contaminated in this manner.

"5. The Conference recommends that comparative tests on a large scale be carried out in certain selected Institutes with vaccines killed by carbolic acid and ether; other methods might subsequently be tested in similar manner.

"6. The Conference recommends that enquiries be made into the plurality of strains of street and fixed virus, and into the rabicidal action of the serum of man and animals during and after immunization.

"Special interest attaches to the detailed investigation of strains of street virus in cases where, in spite of apparently slight risk, treatment fails.

"7. The Conference requests the Health Organization of the League of Nations to consider the possibility of organizing the investigations described in paragraphs 5 and 6, and of arranging for the collection and distribution to the various Institutes of the world of information relating to rabies.

"8. The League's Health Organization is requested to arrange with one or more Institutes that preliminary investigations be carried out with the object of supplying all anti-rabic Institutes with a strain of fixed virus of high protective value.

"9. It is desirable also that the different Institutes should send, from time to time, their own strains of fixed virus to a specially selected Institute for comparative tests.

"It is further recommended that anti-rabic Institutes should examine at regular intervals the strains of fixed virus in use to ensure that their virulence has undergone no modification.

"10. The Health Organization of the League is invited to publish statistics of the results of anti-rabic treatment in the different anti-rabic Institutes of the world. To this end every Pasteur Institute should send each year its statistics tabulated according to a schedule to be drawn up by the Health Organization. Each Institute should report its *total* mortality. In this connexion it is desirable that each Institute should follow

the after history of its patients for at least six months, and whenever possible, for a period of one year after the termination of treatment; the co-operation of the local authorities should be enlisted for this purpose. Each Institute should intimate what it has been able to do regarding this matter.

"Each Institute should analyse the *total* mortality with regard to the following factors:

"(*a*) Species of biting animal;

"(*b*) Evidence of rabies in biting animal (Categories A, B, C, D);

"(*c*) Whether the infection was due to deep or superficial lesion, or whether there was no visible lesion;

"(*d*) Bitten through bare skin or clothing;

"(*e*) Position of bite (head, arm, trunk, legs); (multiple bites to be classed according to the site of greatest danger);

"(*f*) Interval between bite and commencement of treatment: under four days; four to seven days; over seven days.

"Any change in the method of treatment should be reported. All paralytic accidents should likewise be reported with full details, whether such accidents prove fatal or not.

"Separate statistics should be supplied for patients treated in Institutes and for those treated outside."

Fourth Commission.

Vaccination of Animals.

"In spite of the importance of the results already acquired in the study of anti-rabic vaccination of the various animal species, and the large number of animals already successfully vaccinated, the Conference does not consider that it is in a position to propose important changes in sanitary legislation. Nevertheless, the Conference considers it desirable that:

"Dogs be given prophylactic vaccination against rabies; such vaccination, as far as possible, should consist of a single inoculation of a dead killed virus (still capable of conferring immunity), or of a fixed virus, modified or not, which is not pathogenic to the dog when inoculated subcutaneously or intramuscularly.

"This prophylactic vaccination should be repeated each year.

"Such vaccination—at least in the beginning—should be applied in Pasteur Institutes, schools of veterinary medicine or by the local veterinary authority concerned.

"The administrative supervision should be such as to provide for the enumeration of vaccinated dogs and their inspection by a veterinary authority at the end of the fourth month following vaccination.

"All administrative supervision may be relaxed after a sufficient number of dogs have been properly vaccinated.

"The employment of vaccination among dogs exposed to infection should, in suitable cases, permit of relaxation of the sanitary regulations, and that measures applied to bitten animals should be graded as follows: Dogs bitten by animals known to be rabid shall be destroyed even if previously vaccinated. Dogs which are only suspected of having been bitten may be vaccinated on condition that they be isolated for six months.

"Prophylactic curative vaccination of cats should never be employed."

Other Animals.

"*It is desirable* that prophylactic vaccination of animals other than domestic carnivora be practised only in areas where rabies is particularly prevalent. In such vaccination the virus should be either a killed virus (still capable of conferring immunity) or a modified or unmodified fixed virus.

"Vaccination after the animal has been bitten is recommended. In such vaccination the vaccines used should be those indicated in the preceding paragraph. Such vaccination should be given during the four days following the bite, or at the latest before the tenth day.

"Animals bitten by rabid animals, whether treated or not after the bite, should not be butchered between the eighth day and, at the very least, the end of the third month following the bite.

"In the opinion of the Conference the only measures that will completely eradicate rabies are, the restriction of the liberty of the dog, unless muzzled, to the premises of the owner, and the destruction of the ownerless dog. The Conference recommends that these measures be embodied in the legislation of the various countries."

The value of these conclusions will be obvious to all who have studied recent literature regarding rabies. Difficulties have been swept away, new lines of research have been suggested. The activities of the Health Organization of the League have been invoked, with the object of conducting elaborate, comparative tests of various sorts, of ensuring that the strains of fixed virus in use throughout the Pasteur Institutes of the world will be maintained at a standard efficiency, and of publishing statistics of the results of antirabic treatment in the different Institutes, collected and tabulated on a uniform basis.

A. G. McKendrick.

MISCELLANEOUS.

Baldwin (Horace S.) & Cecil (Russell L.). **The Rationale of Specific Therapy in Pneumococcus Pneumonia.**—*Jl. Amer. Med. Assoc.* 1926. Nov. 20. Vol. 87. No. 21. pp. 1709–1715. With 9 charts in text. [18 refs.]

When bacteraemia (septicaemia) develops in the course of infections which are originally localized, the prognosis becomes grave. This is exemplified in the case of staphylococcus, streptococcus, and meningococcus infections. Fatal cases are nearly always complicated by bacteraemia. Pneumococcus pneumonia exemplifies the same facts.

Immunity in the case of the pneumococcus is of a highly specialized kind and extends to the different types of pneumococcus. Type I immunity is of little avail against other types. Again the pneumococcus itself develops a substance which is neutralizing to specific antibody and this substance is rigidly specific for type.

Fatal cases of pneumococcus pneumonia are characterized by the high incidence of bacteraemia. Thus among 37 cases with positive blood culture 29 died, whereas only 7 died of 70 cases with negative blood culture. Toxaemia may occur sometimes, even with high content of blood in protective substances, but the great majority of patients developing these substances recover. A high protective content of blood and bacteraemia rarely occur together. Therefore it may be affirmed that presence of protective substances in the blood constitutes a favourable prognostic sign. The test of protective blood substance is made upon mice, which are very susceptible to pneumococcus infection.

Do these facts encourage attempts at specific serum therapy?

In monkeys specific serum injected intravenously quickly clears the blood of organisms and has been able to save animals receiving lethal doses of pneumococci, even when the serum has been injected 72 hours after the micro-organism. Early administration however is all-important for success. The efficacy has been greatest for Type I infections, but has also been good in the case of Type II.

In man there is good reason to suppose that specific therapy is a sound form of therapy. The sterility of the blood can be brought about in man by the use of antiserum. But it does not follow that this sterility is all that is required: "The serum of a patient with pneumonia, even when the blood is sterile, may contain a substance that has high absorptive power for homologous protective bodies. It may be assumed that this neutralizing substance is the S substance of Avery and Heidelberger." One of the difficulties in the way of satisfactory specific therapy in man is the necessity for injection of large amounts of the foreign serum. Progress in this form of treatment would seem to lie along the lines of being able to obtain sera of high antibody content and as free as possible from foreign protein.

W. F. Harvey.

Miller (L. E.). **Treatment of Pneumonia amongst Natives by Sodium Nucleinate.** *S. African Med. Rec.* 1926. Dec. 11. Vol. 24. No. 23. pp. 531–532.

The author has treated 117 cases of pneumonia in Mine natives with intramuscular injections of sodium nucleinate, 87 lobar pneumonia

and 30 broncho-pneumonia, with case mortalities of 8·04 and 13·3 respectively. Of lobar pneumonia patients 24 had a crisis on the 2nd day after injection and 18 on the 3rd day. He thinks these results sufficiently promising to justify the continuation of this treatment so that a conclusion as to its value may be reached. The method was employed by Dr. Gardner Medwin in influenza cases to induce leucocytosis. In the majority of Miller's cases there was already a leucocytosis and 24 hours after the sodium nucleinate injection the leucocyte count was increased by 7,000 to 9,000. The dose is 0·1 gm. in solution in 2 cc. ampoules. If the temperature did not come down in 48 hours the dose was repeated. Sodium bicarbonate also was given in half-drachm doses every 4 hours in severe cases, and expectorants and stimulants were employed when indicated.

A. G. B.

Bhattacharyya (N.). **A Brief Note on the Morphology, Cultural Characters and Biochemical Reactions of** *Vibriothrix zeylanica* **Castellani.**—*Jl. Trop. Med. & Hyg.* 1926. Nov. 15. Vol. 29. No. 22. pp. 371–374. With 9 text figs. [8 refs.]

The organism is highly polymorphic and may present bacillary, spirillar and spirochaetal forms. It is not considered to be etiologically related to dysentery although isolated from the stools of dysentery cases. The chief characters to be noted are that it is non-pathogenic to animals, highly motile, Gram-negative, a filter passer, incapable of fermenting sugars and non-liquefying.

W. F. H.

Kojima (S.). **On the Differential Diagnosis of** *Bacilli Typhosus, Paratyphosus, Dysenteriae, Cholerae,* **and** *Coli.*—*Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress, Tokyo, 1925.* Vol. 2. pp. 383–385.

Detection of organisms of the typho-dysentery group is effected by the use of Endo and Drigalski-Conradi media. Certain modifications of these are made, such as substitution of brom-thymol blue for litmus, reduction of fuchsin sulphite and lactose constituents to give better differentiation between *B. typhosus* and *B. coli*, adjustment of pH and omission of crystal violet from the medium in the case of dysentery. For the diagnosis of cholera, peptone water, Dieudonné, and Aronson's media are used.

W. F. H.

Mazza (Salvador). Vaccin polyvalent et vaccin monovalent dans le traitement spécifique du chancre mou et du bubon. [**Polyvalent and Monovalent Vaccines in the Specific Treatment of Soft Chancre and Bubo.**]—*Arch. Inst. Pasteur de Tunis.* 1926. June. Vol. 15. No. 2. pp. 157–162.

Professor Mazza reports results obtained in the treatment of eight cases of chancroid in Buenos Aires by means of a polyvalent vaccine prepared by Nicolle and Durand in Tunis from the streptobacillus of Ducrey, and a monovalent vaccine prepared by himself.

He shows that only those cases which give a positive dermal reaction with a virus emulsion yield satisfactory results when treated with the corresponding vaccine ; in other words when using a stock vaccine,its polyvalency must be as great as possible as there would appear to be para-forms of the organism or at least a number of different strains. These difficulties overcome, the treatment gives remarkable results in both cases of soft chancre alone and those with buboes. The vaccine is given intravenously at about 3 days' interval. Improvement is seen within 24 hours of the first treatment and complete healing occurs often after 3 or 4 injections, but it is essential to continue these until complete healing is effected otherwise relapse may occur.

H. S. Stannus.

Ross (I. Clunies). **An Experimental Study of Tick Paralysis in Australia.**—*Parasitology*. 1926. Dec. Vol. 18. No. 4. pp. 410–429. With 2 text figs. [48 refs.]

In Australia tick paralysis is a serious consequence of tick-bite to which domestic animals and man himself are liable. This important paper, describing diversified experimental observations of tick paralysis in the dog—an animal that appears to be particularly susceptible—goes a long way in explaining the nature of the phenomenon.

It appears that in Australia tick-paralysis is communicated only by the mature female of *Ixodes holocyclus* and by her only at a particular time of her life, namely, in the two days before she drops from the host upon which she is gorging. It is then that her salivary glands, which have become enormously hypertrophied, are surcharged with a venomous secretion that contains coagulins.

The paralysis is not communicable by inoculation of blood or cerebrospinal fluid or nerve-tissue of affected hosts, nor by injection of the contents of the body of a tick taken from an affected host, neither have any pathogenous organisms been discovered in the fluids or organs of affected animals. It must follow, therefore, that the salivary secretion (like that of the Thanatophidia) is self toxic –but only at a particular term of life, since in dogs the onset of symptoms has not been observed before the lapse of 5 days from the attachment of ticks, and paralysis has never been observed when ticks are detached from a dog before the lapse of the usual interval for appearance of symptoms. Again, an emulsion of the glands is toxic.

The interval that elapses between the attachment of the tick and the first signs of paralysis is not to be apprehended as an " incubation period " in the host : it is evidently a physiological period proper to the tick herself.

A single tick may cause fatal paralysis in man or dog. The paralysis is progressive and death appears to take place through paralysis of respiration. There is some evidence that immunity may be acquired after recovery. There is no evidence of tick-paralysis being under any seasonal influence.

Although tick-paralysis is communicated by the adult female of *Ixodes holocyclus* only, the immature stages of this species are by no means innocuous in other ways.

A. Alcock.

Donath (W. F.), Mengert-Pfessler (H.) & Oudendal (A. J. F.). **The Iron-Percentage of Liver, Spleen, Kidneys and Blood of the Native Inhabitants, ascertained according to the Chemical Analytical and to the Histo-Chemical Methods.**—*Meded. Dienst d. Volksgezondheid in Nederl.-Indië.* 1926. Pt. 3. pp. 163–277. With 70 figs. [89 refs.]

This is an elaborate and very painstaking piece of research into the occurrence, distribution and causation of haemosiderosis in man in the tropics. The work was carried out at the Medical School, Weltevreden, Dutch East Indies.

There is a short introduction, followed by a paper on the histochemical examination of liver, spleen, and kidney for the presence of of iron pigment by Oudendal. Then follow papers by Donath on the chemical analysis for iron in certain organs of the body and in the blood of man, and by Mengert-Presser on the haemoglobin content of the human blood in the tropics.

These researches originated from observations made at postmortems on Javanese and Chinese dying of various causes. In practically every case crystals, which proved to be iron compounds, were detached in the kidneys, liver, and spleen. The problems these authors attempted to solve were :—

(1) How did the iron content of the liver, spleen, kidney, and blood compare in healthy Europeans living in Europe with those residing in the Tropics, and with healthy natives ?

(2) What effect had such diseases as malaria, amoebiasis, bacillary dysentery, beri-beri, and tuberculosis on the iron content of such organs ?

(3) What was the origin of the iron found : was it derived from ingestion in water or food, or from haemolysins produced by the agency of micro-organisms, toxins, or sunlight ?

Iron content of liver, spleen and kidneys.—

The iron was detected in liver, spleen, and kidneys histologically by staining with Turnbull's method, and it was found by comparison with chemical analysis that the depth of blue colour produced in the tissues by this stain was proportionate to the percentage of contained iron. The chemical analysis for iron was carried out by a slight modification of Newmann's technique ; the blood being left in the organs. The material examined was derived from 266 necropsies in the Dutch East Indies, and from 19 post-mortems in Holland by van Itallie.

The results showed that there was a marked increase of the iron content of these organs in the commoner chronic and wasting diseases (tuberculosis, dysentery, ankylostomiasis, malaria, diabetes and cancer) both in the tropics and in Europe. Thus the normal average iron content for a healthy European liver is about ·005 per cent. (Hueck) ; whereas the average amount of iron found in 266 cases of wasting diseases in the tropics was for liver ·0206 per cent., spleen ·0486 per cent., and kidneys ·011 per cent., and in the 19 cases of wasting disease in Europe the average iron content was for liver ·0225 per cent., spleen ·0523 per cent., and kidneys ·007 per cent. The amount of iron in each organ was found to vary with the disease, the individual, and with the combination of two or more diseases. There was no typical iron distribution for any disease, but the highest iron percentages for the kidneys were obtained in cases of pneumonia and in malaria. The organs in amoebiasis showed a higher iron content than in cases of bacillary dysentery.

The distribution of the iron in these organs was not constant — some areas contained iron, others were free. Moreover, the iron occurred either in form of fine granules or larger masses. In the liver the iron was situated chiefly towards the periphery of the lobules, due perhaps to the slower circulation in this region. In some instances it was confined to the line of the portal tracts in such a way as to suggest a pre-cirrhosis of the liver. The type of cell containing the pigment varied; at times it was found equally in liver parenchyma and in Küpffer's cells, at other times only in liver cells, or in Küpffer's cells. The lymphatic removal of iron pigments from the liver was suggested by the occurrence of these compounds in the lumen, endothelial lining and walls of efferent lymphatics, and in the adjacent lymphatic glands.

The siderosis of the spleen ran parallel to that of the liver; thus the pigment was found chiefly in the endothelium lining the sinuses, in the trabeculae which were fibrotic, and at times in the sinus contents, but the follicles usually escaped. Lymphatic removal of the pigment was seen in the perivascular lymphatics and in those of the capsule, leading to thickening of the capsule and adhesions.

In the kidneys the iron pigment was found to occur chiefly in the epithelial cells of the convoluted tubules; these pigment containing cells desquamated and thus the iron was transported to the lumen of the straight tubules, where it formed conspicuous iron casts which at times caused anuria (c.f. Blackwater fever). The glomeruli were normal.

Interesting animal experiments bearing on the above were performed. Monkeys were fed on rice containing bamboo hairs which, being pointed at both ends, penetrated and remained in the mucosa or submucosa of the gut and caused minute haemorrhages. In this manner a considerable haemosiderosis was produced in spleen, liver, and kidneys within a period of even a week. These results strongly suggested an explanation for the haemosiderosis found in men dying from such diseases as ankylostomiasis, amoebiasis, and intestinal tuberculosis. Experiments were carried out on white rats by exposing them to sunlight, but protecting them from direct solar radiation; these animals died as a result of this treatment and there was a marked increase of the iron content of their livers, spleens, and kidneys. Thus the exposure of man to solar influences in the tropics may lead to an increase of iron compound in the body. But this does not appear to play an important part, as the analysis of these authors' figures referred to above shows as high an iron content in the organs of men dying of wasting diseases in Europe.

The haemoglobin and iron content of the blood in the tropics was investigated by means of the methods of Sahli and Lapique respectively. Preliminary experiments in the estimation of haemoglobin percentages by Sahli's method proved that a certain correction had to be made for the temperature at which the test was carried out. In addition, it was shown that the haemoglobin and iron content of the blood taken from any given case was similar whether it was collected from the lobe of the ear, finger, or by vein puncture. It was found that sojourn in the tropics caused an increase in the haemoglobin and iron content of the blood of healthy Europeans; whereas, all chronic wasting diseases tended to produce a varying degree of anaemia, the haemoglobin and iron being decreased in more or less proportionate amounts; the greatest decrease occurred in amoebiasis and pulmonary tuberculosis.

Results expressed in Averages.

	Haemoglobin percentage.	Iron Content. mgm. per 10 cc. blood.
Healthy—		
Natives	104	6·199
Europeans	97	5·84
Diseases—		
Beri-beri...	91	4·719
Malaria	76	4·334
Leprosy	72	4·049
Amoebiasis	71	3·849
Pulmonary tuberculosis ...	63	3·314
Healthy Europeans in Europe ...	90	4·5

Curves were worked out to demonstrate the effect of sunlight and direct solar radiation on the haemoglobin and iron content of the blood. Rats and monkeys exposed to such influences showed a period of haemoglobin decrease during the first week of treatment, followed thereafter by a steady and continued rise in the percentage of blood haemoglobin and iron. Similar results have been recorded by Spanuth, in Roumania, for convalescents from malaria treated by sunshine. Frei and Alder obtained similar phenomena with guinea-pigs exposed to the effects of Röntgen rays.

Harold E. Whittingham.

Frimodt-Möller (C.). **Further Observations on Sanocrysin Treatment of Indian Patients.**—*Jl. Christian Med. Assoc. of India.* 1926. Sept. 18 pp. [6 refs.]

This reports follows on a previous paper in which eight cases of pulmonary tuberculosis were recorded as treated by sanocrysin up to November 1925. In the present communication the author deals with a total of 32 patients, including those previously reported. This paper has a unique importance in that it deals with Indian patients of a racial type notorious for a tendency to severe and progressive disease; and the good results obtained are, by so much, the more significant.

Dr. Frimodt-Möller, like most of those who have tried sanocrysin in this country, has taken to smaller doses, and a longer interval, than originally advocated by the Danish clinicians. Even with the careful methods of administration employed, several of his cases exhibited disagreeable symptoms and this even when a series of gradually increasing doses had already been well tolerated. In Case No. 22, for instance, up to the seventh injection all had been well; but on the eighth, consisting of half a gram of sanocrysin, a dose which had been well tolerated a week before, transitory albuminuria appeared, stomatitis and dermatitis developed and a very disagreeable condition of buccal ulceration persisted for several months. As a matter of fact, the lung condition steadily improved and the treatment was decidedly valuable to the patient; but the case illustrates the fact that one is never quite safe with sanocrysin and that personal idiosyncrasies may

reveal themselves in the shape of "metallic poisoning," of varying degree at any time and in any patient. The reviewer could supply from his own experience several parallel instances of "toxic" phenomena suddenly arising at a moment when all seemed to be going well. But the fact remains that sanocrysin is so definitely favourable in its action on the majority of suitably selected cases that the physician is thoroughly justified in giving it a careful trial provided that he can ensure to his patients the necessary constant care and supervision during treatment.

Frimodt-Möller works on the following lines: The initial doses are in most cases 10 or 12·5 centigrammes. The following doses (when an increase is indicated) are usually 25, 37·5, 50 and 75 centigrammes, with 1 gramme as a maximum in those cases which reach the highest doses. The course of treatment has consisted of from 8 to 12 injections, spread over from two to four months. The average total amount given per case was 3 grammes; the maximum 4·6 grammes. Of the 32 cases treated, one very "early" case is excluded from consideration as inconclusive and 4 are cut out because still under treatment. Of the remaining 27 cases, 13 or 48 per cent. were much improved, 6 or 22 per cent. improved and one case was not influenced either way. In 7, the treatment had to be interrupted as the patients were unable to tolerate sanocrysin. Tubercle bacilli disappeared from the sputum in 6 out of 17 cases and pyrexia, if present, tended to cease. The author lays stress on the risk attaching to this form of treatment if not carried out with the greatest caution and recommends that it should only be given where the patient is assured of constant supervision in a well-staffed hospital.

S. L. Cummins.

Muelchi (Adeline F.). **Magnesium Sulphate in the Treatment of Tetanus Neonatorum. Report of Case.**—*Amer. Jl. Dis. Children.* 1926. Sept. Vol. 32. No. 3. pp. 393–395. [5 refs.]

Bratusch-Marrain has reported a series of 36 cases of tetanus neonatorum at Graz. To 28 patients in the first group magnesium sulphate was not given and there was only one survival; 7 of the 8 patients of the second group had magnesium sulphate and 4 recovered. Antitoxin was given both intraspinally and subcutaneously and 2 5 cc. subcutaneous injections of a 4 per cent. solution of mag. sulph., then once daily, and afterwards on alternate days. The injections bring about enough relaxation to permit the infant to nurse and time is given to the body to combat the disease. The case here described was that of a negro baby aged 26 days. Tetanus set in on the 10th day. Antitetanic serum was given on the 16th day, a total of 11,500 units. Two doses of a 10 per cent. solution of mag. sulph. controlled the convulsions. Recovery was uneventful.

A. G. B.

Bereiervide (Enrique A.) & de Lara (Francisco). Absceso hepático en un niño de 11 años. Curación. [**Abscess of the Liver in a Boy, 11 years of Age. Cure.**]—*Semana Méd.* 1926. Sept. 2. Vol. 33. No. 35. (1703). pp. 592–594.

The patient, a poorly-nourished boy of 11 years, had suffered from middle-ear disease. He was suddenly seized with a rigor and acute pain

in the right hypochondrium. When examined 20 days later there was a rounded swelling the size of an orange in the lower hepatic region, acutely tender. Puncture revealed pus from which a Streptococcus was grown in pure culture. Operation was forthwith carried out and the abscess evacuated; the temperature fell to normal the following day and convalescence was uneventful. The author could find no cause other than the ear trouble to which the abscess could be attributed.

H. Harold Scott.

CAMERON (A. T.) & NICHOLSON (D.). **An Improved Mode of Expression of Haemoglobin Values.**—*Canadian Med. Assoc. Jl.* 1926. Nov. Vol. 16. No. 11. pp. 1336–1339. [11 refs.]

Since, as WILLIAMSON has shown, normal values of haemoglobin of the blood vary greatly with age, especially up to 16 years, and after that with sex, the authors consider that haemoglobin values can be most accurately reported in plus or minus percentages of the average normal value of the particular age and sex, and they include in this paper a table of variations of haemoglobin with age and sex and a table of mean normal values of haemoglobin based on Williamson's smoothed curve. Values within plus or minus 20 per cent. must be regarded as within normal limits.

TABLE I.

VARIATIONS OF HAEMOGLOBIN WITH AGE AND SEX.

Age.	Males.				Females.			
	Min.	Max.	Mean	Percentage Variation from Mean.	Min.	Max.	Mean	Percentage Variation from Mean.
Days.								
1	18·7	26·7	23·3	—20—+15	20·3	27·3	23·1	—12—+18
2–3	18·9	25·7	22·5	—16—+14	20·6	26·2	23·0	—10—+14
4–8	16·8	28·4	22·0	—24—+29	19·3	24·9	22·1	—13—+13
9–13	18·9	25·3	21·3	—11—+19	18·3	26·1	21·3	—14—+23
Months.								
0·5–2 ...	11·1	25·7	18·7	—41—+37	12·8	22·6	18·0	—29—+26
3–5	10·5	16·5	13·1	—20—+26	12·6	15·8	14·2	—11—+11
6–11	8·0	15·8	13·2	—39—+20	11·2	16·4	14·2	—21—+15
Years.								
1 ...	9·1	15·5	12·9	—29—+20	7·8	16·6	12·2	—36—+36
2 ...	9·4	14·4	12·4	—24—+16	10·6	14·0	12·8	—17—+ 9
3 ...	11·6	15·0	13·2	—12—+14	11·1	15·3	13·1	—15—+17
4 ...	11·1	14·7	13·3	—17—+11	12·0	16·0	14·0	—14—+14
5 ...	11·8	15·4	13·8	—14—+12	11·6	14·8	13·2	—12—+12
6–10 ...	13·4	15·8	14·6	— 8—+ 8	11·8	15·4	13·8	—14—+12
11–15 ...	12·1	16·3	14·5	—17—+12	12·7	15·9	14·9	—15—+ 7
16–20 ...	14·2	19·4	16·8	—18—+18	13·7	17·1	15·7	—13—+ 9
21–25 ...	15·0	18·8	17·2	—13—+ 9	13·6	16·8	15·0	— 9—+12
26–30 ...	14·2	18·2	16·4	—13—+11	14·0	17·8	15·6	—10—+14
31–35 ...	15·1	20·3	16·9	—11—+20	13·2	17·6	15·4	— 8—+ 8
36–40 ...	15·5	18·7	16·9	— 8—+11	12·1	18·1	15·3	—21—+18
41–45 ...	15·3	18·5	16·9	— 9—+ 9	14·4	17·8	15·6	— 8—+ 8
46–50 ...	15·1	19·5	17·1	—12—+14	12·9	17·9	15·5	—17—+15
51–55 ...	14·5	20·1	15·9	— 9—+26	13·7	17·7	16·1	—15—+10
56–60 ...	15·2	18·6	17·0	—11—+ 9	14·2	17·0	15·8	—10—+ 7
61–65 ...	15·2	18·8	16·4	— 7—+ 8	14·5	17·9	15·7	— 7—+14
66–70 ...	14·7	18·7	16·1	— 9—+10	13·0	17·6	15·6	—17—+13
71–75 ...	13·6	17·4	15·2	—11—+14	13·0	17·8	15·4	—16—+16
Over 75 ...	13·9	17·3	15·7	—11—+10	12·7	17·1	15·1	—16—+13

TABLE II.

Haemoglobin Content of the Blood of Infants.

No of. Cases.	Age.	Extreme Values.	Average Value.	Value from Williamson's Chart.
1 ...	8 hours	...	21·5	23·2
3 ...	15, 18, 21 hours	21·3—24·0	22·3	23·2
5 ...	2–3 days	20·1—22·8	21·6	22·7
8 ...	4–10 days	19·6—23·3	22·3	22·1

TABLE III.

Mean Normal Values of Blood Haemoglobin.

Age.	Haemoglobin in grams. per 100 cc. blood.		Haemoglobin in per cent. (100 per cent. = 16·9 grams per 100 cc.).	
	Males.	Females.	Males.	Females.
Birth	23·2	23·2	137	137
2 days	22·7	22·7	134	134
4 „	22·4	22·4	133	133
6 „	22·1	22·1	131	131
10 „	21·4	21·4	127	127
20 „	20·1	20·1	119	119
1 month	19·0	19·0	112	112
2 months	16·2	16·2	96	96
4 „	13·6	13·6	80	80
6 „	13·4	13·4	79	79
9 „	12·9	12·9	76	76
1 year	12·6	12·6	75	75
1·5 year	12·4	12·4	73	73
2 years	12·6	12·6	75	75
3 „	13·1	13·1	78	78
4 „	13·5	13·5	80	80
5 „	13·7	13·7	81	81
7·5 „	14·1	14·1	83	83
10 „	14·4	14·4	85	85
12·5 „	14·7	14·7	87	87
15 „	15·4	15·0	91	88
17·5 „	16·5	15·3	98	91
20 „	16·8	15·4	99	91
30 „	16·9	15·4	100	91
40 „	16·9	15·4	100	91
45 „	16·9	15·4	100	91
50 „	16·9	15·7	100	93
60 „	16·6	15·9	98	94
70 „	15·9	15·4	94	91
80 „	15·7	15·1	93	89

A. A.

Radsma (W.). **A Contribution to the Knowledge of the Chemical Composition of the Blood in the Inhabitants of the Tropics.**—*Far Eastern Assoc. Trop. Med. Trans. Sixth Biennial Congress, Tokyo, 1925.* pp. 1025–1046. [16 refs.]

The observations here recorded were carried out in the Dutch Indies by the most recent and trustworthy methods, and data are

presented mainly in tabular form relating to water-content, haematocrit-values, sugar, non-protein nitrogen, urea and cholesterol content of the blood. The result can be most briefly put, namely, that no definite difference could be detected between the chemical composition of the blood in the tropics as compared with that in Europe and America. This is contrary to certain statements which have been published on this question.

W. D. Halliburton.

Romero Sierra (J. M.). Estudio sobre la sangre humana en Caracas. [**Study of Human Blood in Caracas.**]—*Gac. Méd. de Caracas.* 1926. Sept. 15. Vol. 33. No. 17. pp. 257–266. [31 refs.]

The author carried out examinations on the blood of 17 apparently normal adults in Caracas, and states that the conditions found were different from what obtains in temperate zones on the one hand, and from the findings of Kop in the tropics on the other.

[For the purpose of establishing a normal for the district, uncontrolled examinations such as this are, one is sorry to have to say it, valueless, in spite of the large amount of rather tedious work involved. To give but one or two reasons: In the detailed accounts of the 17 cases every one without exception is stated to have shown anisocytosis; the haemoglobin (which was estimated by Tallqvist's method only) varied between 100 and 60 per cent.; the red cells between 3,600,000 and 5,700,000 per cmm.; the colour index between 0·58 and 1·3; eosinophiles up to 17·9 per cent. In view of these great variations it does not surprise us to find the author stating at the end of his paper that "for greater exactitude it would be well to precede the examination of the blood by an investigation for parasitic infestations."]

H. Harold Scott.

Eggers (H.). Das menschliche Blutbild im Hochtal von Mexiko. [**The Blood Picture of Man in the Highlands of Mexico.**]—*Muench. Med. Woch.* 1926. May 7. Vol. 73. No. 19. pp. 779–781. [2 refs.]

The blood-picture in the highlands of Mexico is characterized by a great increase in the number of red blood corpuscles [as has been observed also in Himalayan altitudes]. In the Mexican mountain dwellers their number is increased to 7¼ millions per cubic mm., and the haemoglobin to 111 per cent. Other characteristic features are leucopenia and relative lymphocytosis, and monocytosis. This leucocytosis of adaptation begins within the first 3 weeks of arrival. In healthy persons the adaptive changes in the blood are quickly consummated by large and rapid gradations. The failure or delay of adaptive changes in the blood is conducive to "mountain sickness." The author emphasizes the importance, for diagnostic purposes, of the study of the blood phenomena at high elevations where, as in Mexico, there may be a considerable population.

[The author does not make any reference to an interesting paper on *Blood Observations at High Altitudes and Some Conclusions . . . in Relation to Mountain Sickness*, by R. W. G. Hingston, published in the *Records of the Survey of India*, Vol. vi, 1914.]

A. A.

REVIEWS AND NOTICES.

RAVAUT (Paul) [Médecin de l'Hôpital Saint-Louis.] Syphilis, Paludisme, Amibiase. Notes de thérapeutique pratique. [**Syphilis, Malaria, Amoebiasis. Notes on Treatment.**] Préface du Professeur Fernand WIDAL. 3rd Edition.—284 pp. 1927. Paris: Masson et Cie, 120 Boulevard Saint-Germain. [22 fr.]

Mankind is scourged by syphilis, malaria and amoebiasis. There are resemblances of a kind between these diseases. Two are of unquestionable protozoan origin and all are characterized by varying chronicity and clinical relapse. Certain preparations of arsenic are of prime value in the treatment of one, and not without some beneficial effect on the patient in the other two. The resemblances hardly go further. They are stressed mostly by those who appear not to have studied all three equally closely. Dr. Ravaut is not of this group of impressionists. A distinguished syphilologist, his accurate first-hand studies of amoebiasis (he was the first to demonstrate amoebic dysentery in Northern France in 1915), and of malaria, have equipped him to set out in one volume, side by side, the essentials of treatment in these three diseases, and ensure for him the interested and respectful attention of his colleagues. He insists on the necessity of repeated courses of treatment after the apparent cure of the primary attack in all three. In syphilis arsenobenzol must be combined with bismuth treatment, in malaria quinine with arsenobenzol, and in amoebiasis emetine with arsenobenzol. In amoebiasis Dr. Ravaut first introduced arsenobenzol treatment per os and showed its great value in that disease; the experience of many others has subsequently confirmed this. In this book are clearly given detailed instructions for variations of dosage of the several drugs, methods of administration, and repetition of courses of treatment, in each type of case usually met with in syphilis, malaria and amoebiasis—diseases which provide the main bulk of tropical medical practice.

H. M. Hanschell.

HURRY (Jamieson B.) [M.A., M.D.]. **Imhotep. The Vizier and Physician of King Zoser and afterwards the Egyptian God of Medicine.**—pp. xvi+118. With 17 illustrations. 1926. Humphrey Milford: Oxford University Press. [7s. 6d.]

This interesting and artistic piece of work, of which only 73 pages treat directly of Imhotep, is a sort of fantasia of nicely blended movements on two predominant themes Ancient Egyptian Medicine and The Hero as Divinity, where the hero is not of the bold invincible type, but of the peaceable patient kind working wonders with pharmacology and irresistible spell.

To Imhotep the mortal contemporary of King Zoser the author gives 24 pages. But "unhappily, we know nothing of his early history. No glimpse is allowed us of his birthplace or early childhood: there is no record of his appearance in the flesh, nor is anything told us of the steps by which he reached the highest post open to an official in Egypt." All that seems certainly known is that he belonged to an architect caste, that he was Grand Vizier as well as Chief Physician and Chief of the Works to a Pharaoh of the 3rd Dynasty named Zoser (*circa* 2980 B.C.), and that he also had other interests in life. For lack of discoverable fact the author

gives us some more or less relevant surmise based on the known duties and responsibilities of the offices held by Imhotep, or on records in which his name appears incidentally. Of his doings as Vizier all that we are told here is that he made a very guarded reply when King Zoser in the difficulties of a prolonged famine asked his advice about propitiating the tutelar deities of the sources of the Nile; but if the surly sinister countenance depicted in the well-executed plate facing p. 4 be a life-like portrait of the King we can imagine that the chief officer of State must have had to bear some very sorrowful burdens. As Chief of the Works, he "in all probability" designed the terraced-pyramid—the destined tomb for the monarch—near Memphis, which stands to this day. As "Magician-Physician" we are told that he had an immense reputation, but also that "unhappily nothing is known of his special work as a physician," though "the important office of vizier must have added prestige to his name and inspired confidence in his patients." With regard to his other interests in life, he was Chief Lector Priest, he perhaps was interested in astronomy and astrology, and—like some great Ministers of State to-day—he was eminent in the literary field. In course of time, Imhotep was gathered to his fathers, was buried no one really knows where ("probably in the desert just outside the city of Memphis"), and was forgotten for a long time.

About thirteen hundred years afterwards, however, the spectre of Imhotep appeared among the Egyptian demigods. This enormous interval—equal to that which separates us from the Heptarchy—is of itself suggestive of some flaw or twist in the course to true deification. A demigod should preserve some show of attachment to an earthly abode, or—like John Nicholson among the people of Bannu—should be acclaimed in his lifetime. This obvious abnormality is here admitted, since it is stated that the story of the hero was "worked up" from records discovered by a priest named Nechautis, who had an eye to an appointment as high-priest of Imhotep "with power to bequeathe that position to his posterity"—an appointment for which he felt himself well qualified. The author gives 9 pages and 3 plates to the demigod Imhotep and his votary Nechautis, and informs us in a footnote that—as might be expected—documents have been discovered that assign a much earlier date to the demigodhood.

More than 2,700 years after Imhotep had shuffled off his mortal coil as Grand Vizier—at a time when Egypt had become a Persian province, and was beginning also to feel the sway of Hellas—he appeared in full glory among the gods of the Egyptians. It has been suggested that this exaltation was due to Hellenic influence, and, in fact, the resident Greeks of Egypt identified him with Aesculapius, and they and their successors under the Ptolemies, as well as the Greeks and Romans of Hellenistic times, commonly worshipped him under that name. The author devotes 32 interesting pages, illustrated by 10 fine plates, to the cult and images and temples of Imhotep after his apotheosis. The temple at Memphis, known to the Greeks as the Asclepiion, became "a famous hospital and school of magic and medicine." Of the temple at Philae, built in the period of the Ptolemies and bearing a dedicatory inscription to Aesculapius over its door, some beautiful ruins still exist, and are here artistically represented.

The author fills the mighty void in the earthly life-history of Imhotep with some remarks on magic and a brief essay on ancient Egyptian Medicine, the latter being compiled from ancient Egyptian documents, portions of which in turn were—or may have been—compiled from still older documents that were contemporaneous with Imhotep; he also makes some references to the well-known appreciation by the Greeks of the skill of Egyptian doctors and the value of their pharmacology. But of Imhotep himself there is nothing to tell—no methods, no pupils, no tradition, no personal touch—"he is said to have produced works on medicine and architecture as well as on more general subjects"; as he "was court physician to King Zoser . . . evidently he moved in the highest social circles"; he "enjoyed a high reputation both as magician and as physician"; it is "his eminence as a healer of the sick that has given

him imperishable fame and that led eventually to his deification." Therefore when the author proceeds to make of this shadowy human figure an almost profanely substantial "Dr. Imhotep," rather "inclined to the scientific side of medicine," a man to be held in everlasting remembrance and reverence by physicians all the world over "as one of the pioneers of their ancient profession," one is rather inclined to wonder whether he is quite serious in his imploration.

A. Alcock.

JOURNAL OF THE BURMA RESEARCH SOCIETY. 1925. Dec. Vol. 15. Part III. pp. 171-267. With 13 plates. And 1926. Dec. Vol. 16. Part III. pp. 166–245. With 12 plates (3 maps), 2 curves & 1 text fig. Published by the Society. 1926. Feb., and 1927 Jan. Rangoon: Printed at the British Burma Press.

The Journal of the Burma Research Society is published three times a year. Until lately it seems to have dealt chiefly with history and the arts, but in 1925 the Society determined that one of the three annual publications should be devoted to science. The Society would thus appear to have taken inspiration to some extent from the Asiatic Society of Bengal, which for nearly 150 years (ever since its foundation in 1784 by the great Oriental scholar, Sir William JONES) has steadily endeavoured to keep all the works of Nature in Asia, and all the imaginative and material productions of the Oriental intellect, within its horizon. In these present days of restricted specialism, however, the attempt so to hold the gorgeous East in fee is less hopeful than it was in the old cheerful days of the pioneers.

In their range, which includes geology, botany, zoology and parasitology, as well as mechanics applied to bridge-building and to hydro-electric developments, and in their plane of execution these first two scientific volumes of the Burma Society are yet of good augury.

Of these diverse subjects, however, only zoology and parasitology can be brought within our purview. In systematic zoology a paper, by G. E. GATES, on the results of a survey of the earthworms of Rangoon is full of information; among other things we learn, incidentally, that in Burma earthworms charred to ashes form an important (and ingenious) ingredient of tooth powder, that one sort of worm-soup is used as a remedy for headaches, and another sort for weakness after child-birth, that earthworms cooked in the grease of gecko lizards are one of the ingredients of an aphrodisiac reputed to be exceedingly potent, and that the liquor decanted from roasted earthworm-castings shaken in water is "very cool medicine for hot stomach." There are five papers on Parasitology—two dealing with Cestodes, two with Trematodes, and one with the larva of an Acanthocephalous worm infesting the Rangoon toad—all contributed from the local University. The two first—respectively entitled *The Tapeworms of the Domestic Fowl*, and *A List of Cestodes collected in Burma 1923–1926*—are by Dr. F. J. MEGGITT, the Director of the Biological Department of the University, who explains that Burma is peculiarly opulent in material for this rather lugubrious branch of study. "The majority of animals dissected contain at least a single specimen, usually many; freedom from infection is extremely rare"; fowls being more heavily infected than any other kind of animal. The List of Cestodes contains the names of 71 species collected from 99 species of animals (mammals, birds, reptiles, amphibia and an annelid). The two papers on Trematodes are by Mr. BHALERAO; in one of them 3 new species and 5 new varieties are described as the spoil from six specimens of a bat (*Nyctinomus plicatus*); the other gives a list of 28 species of Trematodes recorded from Burma, with their several hosts.

A. Alcock.

Hearle (Eric). **The Mosquitoes of the Lower Fraser Valley, British Columbia, and their Control. Report of Work carried out under the Auspices of the National Research Council and the Entomological Branch, Dept. of Agric., Ottawa.**—*Nat. Res. Council. Rep. No. 17.* 94 pp. With frontispiece & 14 plates. 1926. Ottawa.

In the spring and early summer, when the mountain snows of British Columbia are melting, the Fraser River, which springs from them, so far from "shepherding her bright fountains" lets them run wild all over the Lower Fraser Valley to give birth to myriads of mosquitoes—such myriads as at times and places to put a stop to the rural industries and even to interfere with the development of the country. How these insects swarm may be judged from the fact that the author exposing his arm for a few minutes one day towards the end of July, collected 45 of them settled upon it—of 6 species. As a prelude to abating this annual pestilence, a complete survey of the flooded areas and a searching investigation of the life-histories of all the mosquitoes to which they give birth has been made, and the results are here published along with a good deal of information about the local mosquitoes that breed in other, more permanent, waters, and much familiar matter of an educational kind, about the structure and habits of mosquitoes in their adult and developmental stages, their classification, and the various established methods of offence and defence against them.

Altogether the author finds 33 species of mosquitoes represented in the Lower Fraser Valley—13 Aedes, 4 Culiseta, 3 Culex, 2 Anopheles, and 1 Mansonia. Only two of them, however, are prolific pests, namely, *Aedes aldrichi* and *Aedes vexans*, and both have their nursery in the flood-waters. Of these two species very full particulars are given; of the other 31 species the author is content to give much briefer statements of the points by which each may be recognized easily, its relative importance for man and its abundance, its distribution, its breeding-grounds, and its life-history.

Of the two dread pests *Aedes aldrichi* was the more abundant during the present three years' investigation—33 of the 45 mosquitoes that settled on the author's arm, as told, were of this species. It is a vicious biter and inflicts much pain, and it persistently haunts houses, being so small that it can often creep through screens. Its larvae are found almost exclusively in cottonwood flood-swamps; but the adults can travel 15 miles from their watery nest, their dispersion being favoured by woodland. Both sexes are often found together on the flowers of a Spiraea.

Aedes vexans also swarms in enormous numbers. Its characteristic nurseries are pools in flooded meadows, but its adult flights may extend to 10 miles with ease. It also has the Spiraea habit. Both these species (like most of their northern congeners) deposit their eggs on the ground to remain dormant during the winter until the vivifying floods come.

Surveys have been made district by district of the position, extent, and characters of the main breeding areas of the Valley.

Observations have been recorded of the natural checks to mosquitoes and mosquito larvae that have been noticed at work in the field. A Nematode parasite, *Parameris canadensis*, is regarded as a very important check upon *Aedes vexans* by stopping development of the ovaries. Of the effective natural enemies of larvae wading-birds (particularly the Phalarope) the fry of trout and other fish, the larvae of Dytiscid and Hydrophilid beetles, Notonectid bugs, the larva of Eucorethra, and water-mites are specially mentioned; dragonfly larvae, though terribly efficient in a laboratory dish, were noticed to be not very active in the field. Large numbers of larvae were killed by the drying-up of pools.

A. Alcock.

Schwetz (J.). [Agrégé à l'Université de Bruxelles, Médecin inspecteur au Congo Belge, chargé d'une mission d'études par le Comité Spécial du Katanga.] Etudes et Notes d'Entomologie Médicale sur le Katanga (Elevage, Tsé-Tsé, Tiques et Moustiques). [**Studies and Notes on Medical Entomology in the Katanga (Stock-Raising, Tsetse, Ticks and Mosquitoes).**] —pp. vi + 185. With 2 folding maps. 1927. Office de Publicité, Anc. Etabliss. J. Lebègue & Cie, Editeurs, 36 rue Neuve, Bruxelles.

The ultimate obstacle to the exploitation of the riches of Katanga (to use the author's own blunt phrase, who candidly asserts his belief that it is money, not benevolent intention, that makes the mare go) is not so much dearth of labour, but dearth of the good raw meat by which hard labour is sustained. Could live-stock be raised on the large scale in a land so infested with tsetse-flies, this obstacle would be overcome ; and to this question the present Studies contain a lucid and unhesitating answer. These Studies, therefore, though labelled " medical " are not of much immediate interest to the medical profession.

In his interesting account of a well-planned survey of topography and vegetation the author states that, apart from some vast swamps around certain lakes and river-courses, the greater part of Katanga is park-land quite unsuitable for grazing because infested with *morsitans*. There are certain parts, however, particularly in the district of Lomami, where the land is open savannah with fringes of a heavy *palpalis*-infested forest alongside the rivers ; this land would be fit for occupation by graziers if the belts of forest were freed from *palpalis*. But the most important fact is that there are four grassy plateaux—Kundelungu to the east, Biano-Manika to the west, Marungu to the north-east, and Kibara to the north—all at elevations beyond the reach of tsetse-flies and quite suitable both for graziers and their herds. A defect in Kundelungu is that all the approaches to the massif and even to the edge of the plateau are infested with *morsitans*. In the case of Biano-Manika the approaches are free of fly in all directions but one. At Marungu *morsitans* exists on the lower slopes, but there are some safe approaches ; and this plateau is the best of the four because in addition to pasturage it affords good tillage also. Kibara, about the natural beauties of which the author is almost lyrical, has rocky alpine summits and a dry climate which would probably suit sheep.

The results of the author's attentive survey of the distribution of tsetse-flies is exhibited in a large coloured map, but the account in the text is too minutely particular to be of more than local interest. The species generally found are *morsitans* and *palpalis*, *brevipalpis* occurring sparely in only one area, to the north-west. A point of general interest is the well-established suppression of *morsitans* within a radius of 30 km. from Elizabethville ; this triumph is ascribed chiefly to the disappearance of game. Animal trypanosomiasis has followed suit, not a case having been reported within the environs of Elizabethville in 1925 and 1926. The only cases observed by the author were at two farms, one 120 km. to the north, another 85 km. to the south. A list is given of 19 species of mammals and 2 species of reptiles whose blood was examined by the author in different parts of Katanga in 1925 and 1926 without discovery of a single trypanosome.

The only noteworthy point in the report on ticks is the discovery of *Argas persicus* in Elizabethville and two other places in Katanga.

The mosquito survey has already been published elsewhere as a separate paper, and a summary of it is to be found in the Medical Zoology section of this *Bulletin*.

A. Alcock.

Wu Lien-Teh. [M.A. M.D., B.C. (Cantab) ; C.P.H. (Johns Hopkins) ; Hon. Litt. D. (Peking) ; LL.D. (Hong-Kong) ; Sc.D. (Shanghai), etc. **A Treatise on Pneumonic Plague.**—League of Nations. Health Organisation. C.H. 474. 1926. May. pp. xiv+466. With 1 map & 40 figs. on 29 plates (5 coloured).

In this volume Dr. Wu Lien-Teh has brought together according to a well ordered scheme the knowledge and experience of pneumonic plague that has been gained up to the present. The book opens with a history of pneumonic plague gleaned from numerous reports of outbreaks in many lands. Then follows an account of plague in rodents which live in the open country apart from human habitations, and its spread to man. The comparatively small body of knowledge relating to natural plague in the tarbagan is rather surprising when one considers the number of years during which this animal has been suspected to be a plague carrier. For example, it appears that only 15 plague-infected tarbagans have been observed and recorded. Little seems to be known of the mode of spread of the epizootic. There are no observations on the seasonal prevalence of the tarbagan flea. Guineapigs have been infected by the agency of tarbagan fleas, but there is no record of flea-transmission experiments with tarbagans. The interesting problem of the carrying over of the infection through the winter months, when the rodents are hibernating, is still a matter for speculation. The author appears to attach importance to a chronic infection which he has observed in experimentally infected tarbagans and which, he thinks, may, under natural conditions, remain dormant in the hibernating animal, and so bridge the interval between epizootic seasons. Basing his opinion on the extensive work of the Plague Research Commission in India on the significance from an epidemiological standpoint of resolving (chronic) plague in *R. rattus* the reviewer thinks it unlikely that a smouldering infection of this kind will prove to be the link between epizootic periods. He inclines to believe that the infection is carried over in the tarbagan flea ; Bacot's experiments with *C. fasciatus* kept at a low temperature are suggestive in this connexion. Comment is made upon McCoy's statement that pneumonic plague in man rarely occurs from rat infections and that the definite tendency to lung localization in plague-infected ground-squirrels is possibly significant. Pneumonic plague in man is so often found to be associated with plague in "field" rodents as to suggest an exceptionally intimate relationship and yet, as Wu Lien-Teh notes, epizootics among ordinary rats have sometimes led to pneumonic outbreaks in Upper Egypt. This is actually an understatement, the truth being that the pneumonic-plague outbreaks in the Qena-Girga district of Southern Upper Egypt—a typical pneumonic-plague region—owe their ultimate origin *solely*, so far as is known, to plague in *R. rattus* ; in this district *R. rattus* transmits plague to man in the bubonic form by means of its flea, *X. cheopis*.

The chapter on the epidemiology of pneumonic plague is an excellent one, and is interspersed by comments and conclusions with which the reviewer is in general agreement. An important topic discussed is that of mixed infections in pneumonic plague. Dr. Norman White has recently propounded the interesting theory that the *B. pestis* cannot by itself cause widespread epidemics of pneumonic plague, and he has invoked a symbiotic germ which prepares the way for the plague bacillus or reinforces its pathogenic action. Dr. Wu Lien-Teh cannot find evidence in support of this contention, and the reviewer also thinks that on epidemiological grounds the hypothesis is unnecessary. Another subject dealt with in this chapter is the alleged pneumotropism of the plague bacillus and its relation to the rise of epidemics of pneumonic plague.

In a hitherto unpublished paper Wu Lien-Teh and H. M. Jettmar*

*Wu Lien-Teh & Jettmar (H. M.). A Systematic Experimental Study of the Pathology of Pneumonic Plague in the Tarabagan and Sisel (Suslik).—*North Manchurian Plague Prevention Service. Reports* 1925–1926. Vol. 5 of the Series. pp. 1–25. With 1 text fig., 4 coloured plates & 12 microphotos. [42 refs.]

give the histological findings in 20 tarbagans and 9 sisels (susliks) experimentally infected by the method of inhalation. From the results obtained the authors are confirmed in their opinion that infection in plague pneumonia is not a faucial or even a tracheal one, but is essentially an invasion of the deeper portion of the respiratory tract.

In the treatise under review a survey is made of the conceivable modes of infection in pneumonic plague, whether directly from the patient or indirectly by objects contaminated with infective sputum droplets, or by deposits of sputum, or through the medium of the plague corpse, and the conclusion [a sound one] is reached that the patient's cough alone constitutes the real danger, all other modes of infection being merely potential.

The author believes that carriers play only a limited part in the spread of pneumonic plague. The reviewer thinks the carrier rate of respiratory diseases spread by droplet infection must bear a relation to the lethal power of the infecting organism. When, as in pneumonic plague, the mortality is virtually 100 per cent., the carrier problem perforce diminishes to negligible proportions.

Consistently with the opinion that indirect modes of infection play a minor part the statement is made that a critical attitude towards routine disinfection in pneumonic-plague epidemics seems fully justified, and a plea is rightly made for the exercise of discretion and common sense in applying measures of disinfection.

The author would, we think, have added to the usefulness of his report if he had prepared a final summary of the conclusions to which he has come from his comprehensive study of pneumonic plague. Increasing interest is being taken in that group of diseases in which the infective droplet is the medium of transmission from man to man, wherever in the respiratory tract the infecting micro-organism may find entry. The work of WEBSTER on the experimental epidemiology of respiratory infection, that of BLAKE and CECIL on the experimental production of pneumonia, and the epidemiological observations of DUDLEY have helped to make clear the factors which combine to light up and keep alive epidemics of respiratory infection spread by direct contact. The cumulative work on the epidemiology of pneumonic plague assembled in this treatise forms a noteworthy contribution to the subject.

G. F. Petrie.

CHATTERJI (Karuna K.). [F.R.C.S.I., Major, I.T.F. Med. Corps, Surgeon, Medical College Hospitals, Calcutta, etc.] **Tropical Surgery and Surgical Pathology.** With a Foreword by Major-General Sir R. Havelock CHARLES [G.C.V.O., K.C.S.I., M.D., LL.D., M.Ch., F.R.C.S.I., I.M.S. (ret.), etc.]—pp. xxx+244. With 91 plates, 20 in colour & 5 charts. 1927. London: John Bale, Sons & Danielsson, Ltd. 83–91 Great Titchfield Street, W. 1. [16s.]

The need of a textbook of this kind has for some time been felt and the author, a well-known Calcutta surgeon and teacher, is to be congratulated upon a very successful effort to meet a recognized want. In his preface Major Chatterji refers to the difficulties experienced in writing in a foreign language on intricate and technical subjects, and pleads for indulgence in the matter of literary and linguistic shortcomings by no means manifest to the reader. The author's experience has been acquired in India which, with its diversity of climates and climatic conditions, he rightly regards as presenting for the student "an epitome of the world."

In the introductory chapter reference is made to modes of living and the choice of food, beverages, and clothing essential to the maintenance of health in tropical climates. Questions of hospital organization and equipment are touched upon, and the urgent necessity stressed of improving

the latter, especially in rural areas. The physical and mental qualities required of a tropical surgeon are considered and some interesting emergency experiences detailed. Chloroform is regarded as the best and safest general anaesthetic in warm climates, more especially in the absence of skilled anaesthetists, precautions being taken to ensure its purity and prevent decomposition.

Eight chapters are devoted to Amoebiasis as it affects the various regions and viscera of the body, with special reference to the classes of case in which surgical intervention is called for, and the form which such intervention should take. For the evacuation of liver abscess the author favours aspiration, but with the object of avoiding the risk said to be attendant upon the use of large-sized aspirating canulae, and in order to ensure effective removal of clots and debris from the abscess cavity, he employs a special aspiration-irrigation canula with a three-way stopcock arrangement. This ingenious device has in practice given excellent results, one hundred and fifty-three cases having been so treated with one death. The open operation he reserves for those cases in which secondary infection has taken place, in which pus accumulates in spite of repeated aspirations, or where the abscess has burst into a perihepatic space. The interesting observation is made that cerebral complications would appear to be more common after open operation than after aspiration. Major Chatterji is apparently a believer in the existence of " tropical liver " as a distinct clinical entity not necessarily dependent on amoebic infection.

Another section, also of eight chapters, deals with the pathology and surgical aspects of Filariasis perhaps as fully as can be expected in a students' handbook. All tropical surgeons with experience of such cases will agree with the writer in his statement, which has special reference to the involvement of thoracic or intra-abdominal glands, that filarial infection and suppuration often lead to much confusion in diagnosis and that prognosis is frequently grave. Under medicinal treatment for Filariasis generally, and again under the treatment of many of its manifestations the use of ethyl ester margosic by hypodermic and intramuscular injection is advocated. It is stated that by this treatment symptoms are ameliorated, the severity of the inflammatory attacks reduced, and the quiescent periods considerably prolonged. The differentiation of conditions produced by lymphangiectasis of the spermatic cord from other inguino-scrotal swellings—by no means an easy matter—is admirably dealt with. For large hydroceles the writer favours a method of operation by plication and overlapping in preference to eversion or excision. For Chylocele he recommends the same procedure and makes no reference to the possible safety-valve action exerted by tapping at regular intervals, with its consequent prevention of extension of trouble. Lymphadenovarix, most common in the groin, is dealt with very briefly, and the objections hitherto believed to apply in most cases to enucleation of the glands are ignored. The use of the rubber tourniquet in the various operations for elephantiasis of the scrotum is deprecated. The liquid extract of Lodh (*Symplocos Racemosa*) is mentioned as a useful internal remedy in Chyluria.

Section III on the Tropical Granulomata is good, and here again ethyl ester margosic preparations and compounds are said to be of considerable efficacy in treatment. The clinical differentiation between Yaws and Syphilis is very clearly set forth, and the interesting fact recorded that under the influence of pyrexia due to Malaria or other diseases the lesions of yaws may retrogress or clear up altogether. A case actually cured by high fever accompanying Smallpox has been reported. The author devotes a few lines to subacute inguinal lymphogranulomatosis which he does not appear to consider identical with climatic bubo, an affection to which the book contains no further reference.

The views expressed in Section VIII on the relative prevalence of benign and malignant growths in tropical and temperate regions, and the apparent rarity of 'malignant transformation' of benign tumours in India are

interesting, as is the claim to have cleared up malignant growths by injections of ethyl ester copper margosate, supplemented and expedited in some cases by radiation.

In a chapter on Vesical Calculi the author notes that many cases of recurrence after litholapaxy have come under his observation.

The book closes with short chapters on snake bite and on the technique of intravenous injection of saline solution in Cholera. The latter is clear and detailed and likely to be of great and frequent assistance in emergency.

This work can be strongly recommended alike to student and to graduate. It contains much that is original and will well repay perusal and study. The author is a surgeon of experience and resource, and the appreciative remarks of Major-General Sir R. Havelock Charles in his foreword are well merited.

The volume is of convenient size, well printed on excellent paper, and with an entire absence of printer's errors. Plates and illustrations are excellent, many of them quite new.

J. J. Pratt.

KRAUS (R.). [Prof. Dr. Direktor am staatlichen serotherapeutischen Institut in Wien.] 10 Jahre Südamerika. Vorträge ueber Epidemiologie und Infektionskrankheiten der Menschen und Tiere. [**Ten Years' Experience of Infectious Disease in Man and Animals in S. America.**]—pp. viii+182. With 108 text figs. 1927. Jena: Verlag von Gustav Fischer. [11s. 6d.]

In this small book of 180 pages, Professor R. KRAUS, formerly Director of the Bacteriological Institute of the Department of Hygiene in Buenos Aires, has given a summary of the present state of medical affairs in the Argentine, Brazil, and other States of South America. During the last ten years progress in medical education has been very great; according to the author, the number of graduates and students at Buenos Aires and Rio de Janeiro is so large that it is difficult for so many doctors to obtain a decent livelihood, and there are practically no openings for a career for foreigners. The photographs of the medical school at Bahia and of hospitals, there and elsewhere, show large and imposing buildings; the medical education given is good and essentially practical, though still open to criticism in some respects.

There are brief notices of CARLOS FINLAY, OSWALDO CRUZ, and JOSE PENNA, whose names are closely associated with the history of modern hygiene in South America.

The chief tropical diseases met with are enumerated with their geographical distribution, but no attempt is made to give clinical descriptions of them. The treatment of snake bite, and the mode of preparation of antivenene at the Snake Institute at Butantan (Sao Paulo) are described at considerable length, and the article is illustrated with excellent photographs. According to an estimate made by VITAL BRAZIL, about 18,000 persons are bitten by venomous snakes every year in Brazil; of these, 4,000 died before the introduction of serum therapy. It is claimed that, by early treatment, the mortality is reduced to 3 per cent. The author found that antitoxic serum derived from South American crotaline vipers neutralizes the poison of European vipers as completely as that prepared by CALMETTE from European viperine venom. The value of antivenene is so well recognized by the people of South America that there is no difficulty in obtaining an ample supply of live venomous snakes in exchange for serum, syringes and money rewards.

The alleged causal relationship between Chagas's disease, endemic goitre and cretinism is discussed, but Professor KRAUS considers that further study and experience are necessary before the matter can be regarded as definitely settled.

Some remarkable statistics are quoted showing the great and very rapid increase in the population of some of the South American cities : thus, in 1888 the inhabitants of Buenos Aires numbered less than half-a-million ; in 1925, they amounted to more than two-and-three-quarter millions. In the former year the general death rate was 27·17 *per mille* ; in the latter year about 14 *per mille*, a result which can only be attributed to the great improvement that has been effected in the hygienic conditions of the town.

The book is fully illustrated with very good photographs and a few coloured drawings : although each subject can only be considered in a cursory way within the narrow bounds of such a small book, the volume is well worth reading as a convenient and accurate epitome of the present condition of medical science in South America.

H. J. Walton.

Far Eastern Association of Tropical Medicine : Seventh Congress.

We are informed by the General Organizing Secretary of the 7th Congress of the Far Eastern Association of Tropical Medicine, that the seventh Congress will be held in India in December, 1927. The Congress will open on Monday, December 5th, at Calcutta, where the Scientific Sessions will be held, occupying the first week. The Official Delegates will then be taken on certain arranged excursions. The Congress and Tour will end on December 22nd. Applications for membership should be addressed to :—

Lt.-Col. J. Cunningham, I.M.S.,
General Organizing Secretary,
7th Congress, F.E.A.T.M.,
Pasteur Institute of India,
Kasauli, Punjab, British India.